UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF MICHIGAN
SOUTHERN DIVISION

In re Flint Water Cases	Case No. 5:16-cv-10444-JEL-EAS Hon. Judith E. Levy Magistrate Judge Elizabeth A. Stafford

CLASS PLAINTIFFS' OMNIBUS RESPONSE TO VNA DEFENDANTS' MOTIONS TO EXCLUDE TESTIMONY OF PLAINTIFFS' EXPERTS DR. LARRY L. RUSSELL [ECF NO. 2454], DR. CLIFFORD P. WEISEL [ECF NO. 2455], DR. ROBERT A. MICHAELS [ECF NO. 2456], DR. DAVID KEISER [ECF NO. 2458], DR. DARYN REICHERTER [ECF NO. 2459], DR. PAOLO GARDONI [ECF NO. 2460], DR. HOWARD HU [ECF NO. 2461], DR. ROBERT A. SIMONS [ECF NO. 2462] AND DR. PANAGIOTIS "PANOS" GEORGOPOULOS [ECF NO. 2483] AND LAN'S RENEWED MOTION TO EXCLUDE TESTIMONY OF DR. PAOLO GARDONI AND DR. LARRY L. RUSSELL [ECF NO. 2474]

STATEMENT OF THE ISSUES PRESENTED

1. Whether the opinions of Dr. Larry Russell satisfy the flexible analysis set forth by *Daubert* and FRE 702 such that the Court should exercise its broad discretion to allow his opinions to be presented to the jury and subjected to cross-examination.

Class Plaintiffs' Answer: Yes.

2. Whether the opinions of Dr. Paolo Gardoni satisfy the flexible analysis set forth by *Daubert* and FRE 702 such that the Court should exercise its broad discretion to allow his opinions to be presented to the jury and subjected to cross-examination.

Class Plaintiffs' Answer: Yes.

3. Whether the opinions of Dr. Clifford Weisel satisfy the flexible analysis set forth by *Daubert* and FRE 702 such that the Court should exercise its broad discretion to allow his opinions to be presented to the jury and subjected to cross-examination.

Class Plaintiffs' Answer: Yes.

4. Whether the opinions of Dr. Panos Georgopoulos satisfy the flexible analysis set forth by *Daubert* and FRE 702 such that the Court should exercise its broad discretion to allow his opinions to be presented to the jury and subjected to cross-examination.

Class Plaintiffs' Answer: Yes.

5. Whether the opinions of Dr. Howard Hu satisfy the flexible analysis set forth by *Daubert* and FRE 702 such that the Court should exercise its broad discretion to allow his opinions to be presented to the jury and subjected to cross-examination.

Class Plaintiffs' Answer: Yes.

6. Whether the opinions of Dr. Daryn Reicherter satisfy the flexible analysis set forth by *Daubert* and FRE 702 such that the Court should exercise its broad discretion to allow his opinions to be presented to the jury and subjected to cross-examination.

Class Plaintiffs' Answer: Yes.

7. Whether the opinions of Dr. Robert A. Michaels satisfy the flexible analysis set forth by *Daubert* and FRE 702 such that the Court should exercise its broad discretion to allow his opinions to be presented to the jury and subjected to cross-examination.

Class Plaintiffs' Answer: Yes.

8. Whether the opinions of Dr. David Keiser satisfy the flexible analysis set forth by *Daubert* and FRE 702 such that the Court should exercise its broad discretion to allow his opinions to be presented to the jury and subjected to cross-examination.

Class Plaintiffs' Answer: Yes.

9. Whether the opinions of Dr. Robert Simons satisfy the flexible analysis set forth by *Daubert* and FRE 702 such that the Court should exercise its broad

discretion to allow his opinions to be presented to the jury and subjected to cross-examination.

Class Plaintiffs' Answer: Yes.

CONTROLLING OR MOST APPROPRIATE AUTHORITY

Daubert v. Merrell Dow Pharms., Inc., 509 U.S. 579 (1993)

Best v. Lowe's Home Ctrs., Inc., 563 F.3d 171 (6th Cir. 2009)

In re Scrap Metal Antitrust Litig., 527 F.3d 517 (6th Cir. 2008)

Phillips v. Cohen, 400 F.3d 388 (6th Cir. 2005)

Federal Rule of Evidence 702

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I. INTRODUCTION

The LAN and VNA Defendants (together, "Defendants") have never encountered an expert in this case that they did not seek to exclude, regardless of whether they have a basis for doing so (consistently, they do not). Accordingly, at the April 19, 2023 hearing, this Court urged Defendants "in the strongest possible terms to read the case law on *Daubert* motions." ECF No. 2422, PageID.77251, lns. 13–14; *see id*., PageID.77251–252. Defendants did not heed the Court's advice.

Class Plaintiffs previously filed fourteen expert reports in support of their motion for class certification. In response, Defendants collectively filed fifteen motions to exclude those experts' opinions, repeatedly arguing that those experts—all established academics or professionals in their respective fields—were not qualified, or that the methods they used were "unreliable" because they produced conclusions with which Defendants disagreed. These motions largely failed. The Court did not need to consider most for the task of certifying a class; and as to the remaining two, it rejected the majority of Defendants' arguments. *See* ECF No. 1957 (Second Amended Order on Class Certification and Motions to Exclude).

Rather than learning from this experience or from the Court's express statement that their kitchen-sink approach to *Daubert* motions is "not helpful" to the Court, ECF No. 2422, PageID.77251, lns. 24–25, Defendants have filed ten more

motions to exclude Class Plaintiffs' experts—at least one motion for each of the nine experts that Class Plaintiffs anticipate they may call at trial.[1]

Defendants' motions again ignore basic principles under the Supreme Court's decision in *Daubert* and Federal Rule of Evidence 702: motions to strike expert testimony are not a substitute for vigorous cross-examination, and disagreement with facts or conclusions does not render an expert's opinion unreliable or inadmissible. To be sure, the Court plays an important role in ensuring that junk science and hypothetical assertions free from any factual basis do not enter the courtroom under the guise of expert testimony. Those concerns are not a problem here. Each of Class Plaintiffs' experts applied a sound methodology to the specific facts of this case to reach their respective conclusions. Defendants' disagreements with those conclusions are properly addressed on cross-examination at trial.

At trial, Class Plaintiffs expect to offer testimony from some or all of nine experts to assist the jury's consideration of various certified issues. *See* ECF No. 2250, PageID.73963 (stating certified issues). As relevant to Defendants' motions to strike, these are:

[1] Nine of the ten motions were filed by VNA, and LAN has joined those motions. The sole testimony that only one of the two Defendants seeks to exclude is the engineering ethics testimony of Dr. Larry Russell, which only LAN has moved to exclude. All other testimony discussed in this brief has been challenged by both Defendants.

- Dr. Paolo Gardoni and Dr. Larry Russell (Issue 1 – Duty of Care). Dr. Gardoni, a professional engineer and engineering ethicist, relies on well-established engineering codes of conduct, including the fundamental canons requiring engineers to put public health and safety at the forefront, to opine that Defendants' actions violated the accepted standards of care. Dr. Russell, a practicing professional engineer with over 40 years of experience (including as an elected director of a municipal water district), applies his education, training, and experience to opine that various failures on the part of Defendants constituted breaches of standard of care for engineers.

- Dr. Larry Russell and Dr. David Keiser (Issue 3 – Capability of Water to Harm Properties. In addition to opining on Defendants' breach of the standard of care, Dr. Russell—as relevant to Defendants' pending motions—conducted an analysis of pipe segments taken from the homes of two named plaintiffs. His analysis corroborates his prior opinion that the water conditions in Flint were capable of causing harm to pipes, as the pipes sustained the type of damage that one would expect to see from corrosive water conditions. Dr. Keiser, an economics professor, provides testimony that will help the trier of fact understand the water's capacity for harming property values in the City of Flint. He explains the decrease in

property values that occurred as a result of the water crisis by using a difference-in-differences economic model that contextualizes that decline.

- Dr. Clifford Weisel, Dr. Panos Georgopoulos, Dr. Howard Hu, and Dr. Robert A. Michaels (Issue 3 – Capability of Water to Cause Physical Harm to Residents). Dr. Weisel, Dr. Georgopoulos, and Dr. Hu present an integrated risk assessment that draws upon the fields of exposure science, biokinetic modeling, toxicology, and epidemiology to demonstrate that the drinking water in Flint during the Class Periods was capable of causing adverse physical health effects to Class Members. Specifically, these experts opine that: (1) Flint's water lead levels were elevated during the Class Period (Dr. Weisel); (2) Through the application of rigorous biokinetic modeling, it may be demonstrated that elevated water lead levels will cause an associated increase in blood lead levels for those Class Members who ingested the contaminated water (Dr. Georgopoulos); and (3) The elevated blood lead levels caused by elevated water lead levels in Flint during the Class Period are capable of causing adverse health effects (Dr. Hu). Dr. Michaels is an experienced toxicologist who employed the well-accepted Bradford Hill methodology to analyze the capability of the contaminated water during the Flint Water Crisis to cause skin rashes.

- Dr. Daryn Reicherter (Issue 3 – Capability of Water to Cause Mental/Emotional Harm to Residents). Dr. Reicherter, a psychiatrist and expert in the assessment of community trauma, considered the conditions and characteristics of the City of Flint and opines that depriving its residents of access to safe drinking water was capable of causing—and indeed caused—emotional harm and collective community trauma.

- Dr. Robert Simons (Issue 3 – Capability of Water to Harm Businesses). Dr. Simons, an expert in urban development and finance, calculates the losses that Flint businesses suffered as a result of the Flint Water Crisis in order to conclusively demonstrate that the contaminated water conditions were, in fact, capable of causing harm to businesses in Flint.

Defendants' arguments to strike testimony from every single expert that Class Plaintiffs may call at trial repeat many of the failed points they raised at class certification. Most glaringly, Defendants repeatedly attack conclusions rather than methodologies—pointing, for instance, to purportedly "ignored" evidence that Defendants believe requires a different outcome, or to their own experts' contrary opinions. These sorts of disputes are properly addressed at trial. By presenting them prematurely through meritless motions to exclude, Defendants have created an unnecessary amount of work for the Court and Class Plaintiffs.

While much of Defendants' motions to strike echoes their prior filings, one new and equally flawed theme appears throughout: Defendants consistently frame opinions regarding harm caused by the water conditions as "irrelevant" to an issues trial in which the trier of fact will decide whether the water was capable of causing harm but will not award any damages. *See, e.g.*, *infra* §§ II(B)(2)(c) (Russell), II(B)(8)(b)-(c) (Keiser), II(B)(9)(b) (Simons). Defendants' position contravenes basic logic. Evidence that the water ***in fact*** caused harm—whether to residents, properties, or businesses—is *prima facie* evidence that it was ***capable*** of doing so. Indeed, it is the strongest and most persuasive evidence of that point. Evidence of the magnitude of the harm caused is likewise probative of capacity to cause harm: widespread or significant harm attributable to the water conditions underscores the harmful nature of the water and provides further support for the argument that it was the ***water*** capable of causing (and thus actually causing) the harm, rather than another variable.

Defendants' motions spill much ink that would have been better spent on draft examinations of Class Plaintiffs' witnesses for trial and proposed instructions to the jury regarding the issues that must be decided in this case. Nothing in their motions demonstrates that Class Plaintiffs' experts lack the necessary qualifications to render their opinions, that they relied on unsound methodologies, or that their opinions lack

an adequate basis in the record. Defendants' motions to exclude or limit Class Plaintiffs' experts' testimony should be denied.

II. LEGAL STANDARD

Established law sets forth the standard for evaluating expert testimony under Federal Rule of Evidence ("FRE") 702 and *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993). Under FRE 702:

> [A] witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if:
>
> (a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or determine a fact in issue;
> (b) the testimony is based on sufficient facts or data;
> (c) the testimony is the product of reliable principles and methods; and
> (d) the expert has reliably applied the principles and methods to the facts of the case.

Fed. R. Evid. 702. The United States Supreme Court's precedent in *Daubert* empowers the trial court to act as a "gatekeeper" such that it may exclude only expert evidence that is irrelevant or "unreliable" under FRE 702. *Clark v. W & M Kraft, Inc.*, 476 F.App'x 612, 616 (6th Cir. 2012) (citing *Daubert*, 509 U.S. at 596–97). The guidelines for assessing expert testimony strike a balance between "a liberal admissibility standard for relevant evidence," and the policy goal of protecting the jury from "misleading 'junk science.'" *Best v. Lowe's Home Ctrs., Inc.*, 563 F.3d 171, 176–77 (6th Cir. 2009).

Class Plaintiffs set forth much of the law governing the admissibility of expert testimony in their Omnibus Response on the Law Regarding Defendants' Motions to Exclude Expert Testimony (ECF No. 1516). Given the different posture of the case, Class Plaintiffs highlight and expand upon the relevant legal principles here.

A. The Court has broad discretion in the "flexible" *Daubert* analysis.

The "flexible framework" for evaluating expert testimony focuses on two factors: relevance and reliability. *See Daubert*, 509 U.S. at 589. The Supreme Court has expressly acknowledged that "[m]any factors will bear on the inquiry, and we do not presume to set out a definitive checklist or test." *Id*. at 593. It did, however, set out "some general observations":

> Ordinarily, a key question to be answered in determining whether a theory or technique is scientific knowledge that will assist the trier of fact will be whether it can be (and has been) tested.... Another pertinent consideration is whether the theory or technique has been subjected to peer review and publication.... Additionally, in the case of a particular scientific technique, the court ordinarily should consider the known or potential rate of error, and the existence and maintenance of standards controlling the technique's operation.... Finally, general acceptance can yet have a bearing on the inquiry. A reliability assessment does not require, although it does permit, explicit identification of a relevant scientific community and an express determination of a particular degree of acceptance within that community.

Id. at 593–94 (alteration in original) (internal quotation marks and citations omitted).

The Sixth Circuit has observed the Supreme Court's admonishment that "*Daubert*'s list of specific factors neither necessarily nor exclusively applies to all experts or in every case," and it has further noted that *Daubert* is "only of limited

help in assessing technical or experiential expertise." *First Tenn. Bank Nat'l Ass'n v. Barreto*, 268 F.3d 319, 334–35 (6th Cir. 2001) (quoting *Kumho Tire Co., Ltd. v. Carmichael*, 526 U.S. 137, 141 (1999) and *Berry v. City of Detroit*, 25 F.3d 1342, 1349 (6th Cir. 1994)); *United States v. Jones*, 107 F.3d 1147, 1158 (6th Cir. 1997) (recognizing that the *Daubert* factors are of limited utility in the context of non-scientific testimony, for example, in realms derived substantially from practical experience).

Daubert's approach is therefore adaptable, reconciling the "liberal thrust" of FRE 702 which "relax[es] the traditional barriers to opinion testimony" with the responsibility to "screen[ ] such evidence" in order to keep truly unreliable or invalid opinions from the jury. *See Daubert*, 509 U.S. at 588–89 (internal quotation marks and citation omitted); *see also Jahn v. Equine Servs., PSC*, 233 F.3d 382, 388 (6th Cir. 2000) ("Experts are permitted a wide latitude in their opinions, including those not based on firsthand knowledge, so long as 'the expert's opinion [has] a reliable basis in the knowledge and experience of the discipline.'" (quoting *Daubert*, 509 U.S. at 592)). In line with this, district courts have "considerable leeway in deciding in a particular case how to go about determining whether particular expert testimony is reliable," *Kumho Tire*, 526 U.S. at 152, and the Sixth Circuit will review that type of decision only for an abuse of discretion, *Nelson v. Tenn. Gas Pipeline Co.*, 243 F.3d 244, 248 (6th Cir. 2001); *United States v. Kalymon*, 541 F.3d 624, 636 (6th Cir.

2008). This standard recognizes that *Daubert*'s "flexible" test considers many indicia of reliability, some of which may have more or less relevance than others, depending on the particular science and expert before the court. *See Kumho Tire*, 526 U.S. at 150.

B. Daubert is not intended to replace adversarial cross-examination and exclusion of expert testimony is "the exception rather than the rule."

A district court's review under *Daubert* should not act as a replacement for the adversary system. *Burgett v. Troy-Bilt LLC*, 579 F.App'x 372, 376 (6th Cir. 2014), citing Fed. R. Evid. 702 Advisory Comm. Note (2000). On the contrary, the appropriate means for attacking evidence that is "shaky but admissible" is through vigorous cross-examination, presentation of contrary evidence, and instruction by the judge to the jury on the applicable burden of proof. *Daubert*, 509 U.S. at 596; *see also, e.g., Best*, 563 F.3d at 180 (expert testimony was admissible where defendants raised only "factual disputes suitable for cross-examination"); *Innovation Ventures, L.L.C. v. Custom Nutrition Labs., L.L.C.*, 520 F. Supp. 3d 872, 877 (E.D. Mich. 2021) (listing factors that the parties claimed their respective adversaries' experts failed to consider and stating that "[s]uch alleged deficiencies are better tested under the rigors of cross-examination at trial and resolved by the trier of fact").

It is well established that the "rejection of expert testimony [under *Daubert*] is the exception rather than the rule." *United States ex rel. Tenn. Valley Auth. v. 1.72*

Acres of Land, 821 F.3d 742, 749 (6th Cir. 2016); *In re Scrap Metal Antitrust Litig.*, 527 F.3d 517, 530 (6th Cir. 2008) (quoting Fed. R. Evid. 702 Advisory Comm. Note (2000)); *Cason-Merenda v. Detroit Med. Ctr.*, 2013 WL 1721651, at *5 (E.D. Mich. Apr. 22, 2013).

Any "doubts" about the admissibility of expert testimony therefore "should be resolved in favor of admissibility." *In re E.I. du Pont de Nemours & Co. C-8 Pers. Inj. Litig.*, 348 F. Supp. 3d 698, 709 (S.D. Ohio 2016) (citing *Daubert*, 509 U.S. at 594).

Any challenges that go merely to the weight, and not the admissibility, of proposed expert testimony must be left for the trier of fact to resolve. *Cason-Merenda*, 2013 WL 1721651, at *5–6.

C. Experts may rely on the opinions of other experts.

As this Court has previously ruled with respect to whether one expert could rely on another at the class certification stage, "The answer is yes. I mean, experts rely on other experts. . . ." ECF No. 1787 (May 25, 2021 Trans.), PageID.63792. Indeed, "[e]xperts routinely rely upon other experts hired by the party they represent for expertise outside of their field." *See, e.g., Apple Inc. v. Motorola, Inc.*, 757 F.3d 1286, 1321 (Fed. Cir. 2014), *overruled on other grounds by Williamson v. Citrix Online, LLC*, 792 F.3d 1339 (Fed. Cir. 2015) (collecting cases); *Asad v. Cont'l Airlines, Inc.*, 314 F. Supp. 2d 726, 740 (N.D. Ohio 2004) ("Under Rule 703, an

expert's testimony may be formulated by the use of the facts, data and conclusions of other experts." (citing *Barris v. Bob's Drag Chutes & Safety Equip., Inc.*, 685 F.2d 94, 102 n. 10 (3rd Cir. 1982))); *United States v. 1014.16 Acres of Land*, 558 F.Supp. 1238, 1242 (W.D. Mo. 1983), *aff'd*, 739 F.2d 1371 (8th Cir. 1984) ("An expert cannot be an expert in all fields, and it is reasonable to expect that experts will rely on the opinion of experts in other fields as background material for arriving at an opinion.").

D. Disagreements with methodologies or conclusions are not bases to exclude under *Daubert* where the expert has used a reliable methodology.

Disagreement with an expert does not support excluding a proffered opinion: the district court's role as a gatekeeper is "to determine whether the principles and methodology underlying the testimony itself are valid," *United States v. Bonds*, 12 F.3d 540, 556 (6th Cir. 1993), "not to second guess the validity of conclusions generated by otherwise valid methods, principles, and reasoning," *Pride v. BIC Corp.*, 218 F.3d 566, 577 (6th Cir. 2000); *see also Daubert*, 509 U.S. at 595 (emphasizing that the focus of the inquiry "must be solely on principles and methodology, not on the conclusions that they generate"); *Best*, 563 F.3d at 177 (same); *Glaser v. Thompson Med. Co.*, 32 F.3d 969, 975 (6th Cir. 1994) ("Such differences in opinions among medical experts do not invalidate Dr. Zaloga's opinion, but rather create material issues of fact which must be resolved by the jury.").

Accordingly, the party offering the expert testimony does not need to prove that the expert's testimony is correct: whether an expert's opinion is accurate goes to weight of the evidence, not to its admissibility, and "the district court appropriately passed the torch to the jury to make this determination." *In re Scrap Metal*, 527 F.3d at 531.

Despite these principles, Defendants' motions consistently attack Class Plaintiffs' conclusions or raise issues of disputed fact that go to weight rather than admissibility. The Sixth Circuit's analysis in *In re Scrap Metal* is therefore instructive: in that case, the defendant did not challenge the expert witness's qualifications, the relevance of his testimony, nor the general reliability of the method he used to determine damages. *Id*. at 529. Rather, the defendant argued that the expert witness "used erroneous data and necessarily produced an erroneous conclusion..." *Id*. As a result, the defendant contended that the district court should have excluded the expert witness' testimony as insufficiently reliable under FRE 702. *Id*. The Court of Appeals rejected this argument because "it fundamentally confuses the *credibility and accuracy* of [the expert witness'] opinion with its *reliability*." *Id*. (emphasis in original). Instead, "a determination that proffered expert testimony is reliable does not indicate, in any way, the correctness or truthfulness of such an opinion." *Id*.

In re Scrap Metal ruled that reliability requires that the expert's testimony "be supported by appropriate validation—i.e., 'good grounds,' based on what is known." *Id*. (citing *Daubert*, 509 U.S. at 590). In a *Daubert* motion, district courts are merely required to assess whether the expert testimony "rests upon a reliable foundation, as opposed to, say, unsupported speculation." *Id*. at 529–30. As the Sixth Circuit further explained, courts "will generally permit testimony based on allegedly erroneous facts when there is ***some*** support for those facts in the record." *Id*. at 530 (emphasis added). Because the expert witness at issue in *In re Scrap Metal* offered a foundation for how and why he analyzed the data the way he did, he had sufficiently established that he performed his analysis according to a reliable method and reliably applied that method to the facts of the case—and the defendant's points accordingly went to weight rather than admissibility. *Id*.

In addition to not requiring "correct" conclusions, FRE 702 likewise does not "require perfect methodology." *Best*, 563 F.3d at 181. Indeed, in *Best*, the Sixth Circuit held that where the expert's overall methodology was acceptable, "[a]ny weaknesses in his methodology will affect the weight that his opinion is given at trial, but not its threshold admissibility." *Id*. at 182. The Third Circuit has likewise explained that "[t]he grounds for the expert's opinion merely have to be good, they do not have to be perfect. The judge might think that there are good grounds for an expert's conclusion even if the judge thinks that there are better grounds for some

alternative conclusion, and even if the judge thinks that a scientist's methodology has some flaws such that if they had been corrected, the scientist would have reached a different result." *In re Paoli R.R. Yard PCB Litig.*, 35 F.3d 717, 744 (3d Cir. 1994).

E. Battles of the experts do not justify exclusion.

As this Court has correctly recognized, a "battle of the experts is properly fought at trial." *In re Flint Water Cases*, No. 17-10164, 2021 WL 5356295, at *7 (E.D. Mich. Nov. 17, 2021) (citing and quoting *Phillips v. Cohen*, 400 F.3d 388, 399 (6th Cir. 2005) for the proposition that "competing expert opinions present a 'classic battle of the experts,' and it is up to a jury to 'evaluate the credibility of each expert'"); *accord, e.g., Conde v. Velsicol Chem. Corp.*, 804 F. Supp. 972, 984 (S.D. Ohio 1992), *aff'd*, 24 F.3d 809 (6th Cir. 1994) ("[W]hen the Court is confronted with a 'battle of the experts, the jury must decide the victor.'") (internal citation omitted); *Food Lion, LLC v. Dean Foods Co.*, 2016 WL 806076, at *5 (E.D. Tenn. Jan. 21, 2016) ("This is a classic battle of experts and neither *Daubert* nor any of the thousands of cases applying it provide any support for plaintiffs' apparent position that the Court should exclude the testimony of an expert witness because another's opinions are more credible.").

III. ARGUMENT

A. The Proposed Amendment to FRE 702 Does Not Change the Analysis and Confirms the Futility of Defendants' Motions.

As a threshold matter, LAN urges a new "heightened" standard of review for expert testimony pursuant to an as-yet-unimplemented amendment to FRE 702. ECF No. 2474, PageID.81758. LAN's attempt to exclude admissible expert testimony by reframing the analysis as governed by a novel standard fails both procedurally and substantively.

Procedurally, the proposed amendment to FRE 702 LAN cites has not yet gone into effect—a point that LAN itself concedes. ECF No. 2474, PageID.81758. LAN cites no authority for its request that this Court decide LAN's motions under a rule that is not yet part of the Rules of Evidence—and thus does not and cannot govern the issues in LAN's motion.

More importantly, even were LAN's request procedurally proper, it fares no better on the substance. Far from effecting a sea change in expert testimony admissibility, the Advisory Committee's note makes clear that "Nothing in the amendment imposes any new, specific procedures," and "nothing in the amendment requires the court to nitpick an expert's opinion in order to reach a perfect expression of what the basis and methodology can support." *See* Ex. 1[2] (Advisory Committee

[2] All Exhibits are attached to the Declaration of Katherine Peaslee, filed concurrently with this brief, unless otherwise noted.

on Evidence Rules, Committee Note Proposal) at 0231. Rather, the rule simply clarifies that the FRE 104(a) preponderance of the evidence standard applies to expert testimony offered under FRE 702 and "does not permit [an] expert to make claims that are unsupported by the expert's basis and methodology." *Id*. Class Plaintiffs have never argued otherwise, and this Court has itself acknowledged that the Sixth Circuit already applies a preponderance of the evidence standard for review of expert testimony. *In re Flint Water Cases*, No. 17-10164, 2021 WL 5356295, at *2 (citing *Pride*, 218 F.3d at 578). In other words, the "new" Rule 702—when it actually goes into effect—does not change the analysis at all.

The Committee's notes on the amendment do, however, highlight why Defendants' repeated arguments fail. Those notes explain, for instance, that "if the court finds it more likely than not that an expert has a sufficient basis to support an opinion, the fact that the expert has not read every single study that exists will raise a question of weight and not admissibility." Ex. 1 at 0229. Here LAN has, for instance, attacked Dr. Russell and Dr. Gardoni for their purported failure to consider evidence LAN views as important. *See infra*, § III(B)(1)(c). But there is a difference between considering evidence sufficient to support an opinion on the one hand, and considering the evidence LAN likes best on the other. Class Plaintiffs' experts have done the former, and LAN may cross-examine them with the latter.

Likewise, the Advisory Committee notes that "[i]t will often occur that experts come to different conclusions based on contested sets of facts," and that in such instances deciding between the competing experts may be an issue for the jury. Ex. 1 at 0229. This concisely captures a flaw that pervades Defendants' motions to exclude Class Plaintiffs' experts. As well-established caselaw makes clear, disagreements between experts relying on differing versions of the facts do not warrant exclusion. *See supra*, §§ II(D)-(E). The Advisory Committee Notes that LAN touts as supposedly setting out a new standard in fact underscore this long-standing rule. *See id*.

The Advisory Committee's newly-proposed notes do not obviate their prior notes—on the contrary, they expressly cite to the notes from the 2020 Amendment. Ex. 1 at 0229. As this Court has rightly noted, the "Advisory Committee Notes to Federal Rule of Evidence 702 make clear that 'rejection of expert testimony is the exception rather than the rule' and that 'the trial court's role as gatekeeper is not intended to serve as a replacement for the adversary system.'" ECF No. 1957 (Second Amended Order on Class Certification and Motions to Exclude), PageID.68147. These principles remain unchanged.

In short, LAN cannot save its faulty motions by pointing to an amended FRE 702. Under binding Sixth Circuit caselaw and long-established principles of

review, Class Plaintiffs' expert testimony meets the requirements of both *Daubert* and the Federal Rules of Evidence.

B. Defendants' Motions to Exclude Class Plaintiffs' Expert Testimony Fail.

1. Dr. Paolo Gardoni and the Ethics Opinion of Dr. Larry Russell

Class Plaintiffs' experts Dr. Paolo Gardoni and Dr. Larry Russell offer opinions regarding engineering codes of ethics and the failure of VNA and LAN to adhere to the standard of care applicable to engineers. Both are eminently qualified to do so.

Dr. Gardoni is an Ethics Professor in the Department of Civil and Environmental Engineering at the University of Illinois at Urbana-Champaign, and his report focuses on the duties reflected in the Codes of Ethics issued by the American Society of Civil Engineers ("ASCE") and the National Society of Professional Engineers ("NSPE"). *See* ECF No. 1208-114 (Gardoni Rpt.), PageID.37173–74. Dr. Gardoni then applies the codes to the facts of this case to assess whether VNA and LAN acted in accordance with the codes' provisions, concluding that they did not. Dr. Gardoni centered his discussion around the codes because they reflect the consensus of practicing engineers. *Id*., PageID.37162–63. However, the duties they articulate arise from the research, literature, and experience of those in the profession, not merely the ethical codes themselves.

Dr. Gardoni's opinion relies in part on the technical opinions of Class Plaintiffs' engineering expert Dr. Larry Russell. Dr. Russell is a registered professional engineer in Michigan (and approximately 30 other states) with a Ph.D. in Civil and Environmental Engineering, and he himself also offers an opinion with respect to VNA's and LAN's failure to satisfy their duties as professional engineers. ECF No. 1208-67 (2020 Russell Rpt.), PageID.35418. Dr. Russell concludes, based on his experience as a professional engineer with expertise in water quality and water distribution systems and the practice of engineering in Michigan, that VNA and LAN did not satisfy those duties and specifies their shortcomings in detail. *See id.*, PageID.35422–23.

LAN seeks to exclude both Dr. Gardoni's and Dr. Russell's opinions on engineering ethics, claiming they are "unqualified" and that their testimony is irrelevant and unreliable. LAN does not make any new arguments regarding Dr. Russell's technical analysis, but rather repackages flawed—and previously rejected—arguments regarding his and Dr. Gardoni's opinions related to engineering ethics and the related standard of care. LAN also "re-urges" its prior motion to exclude Dr. Gardoni and Dr. Russell. *See* ECF No. 2474, PageID.81749. Class Plaintiffs have already briefed a response to that motion, and respectfully refer the Court to that response. *See* ECF No. 1533.

VNA, for its part, does ***not*** seek to exclude Dr. Russell's opinion regarding the ethical duties of engineers, but has moved to exclude the opinion of Dr. Gardoni.

Neither Defendant raises any basis to strike either experts' opinions regarding the ethical codes reflecting the professional standards that Defendants failed to meet. Rather, Defendants consistently attack conclusions rather than methodologies, both with respect to Drs. Gardoni and Russell as well as across their other motions to exclude Class Plaintiffs' experts. The opinion of VNA's own engineering ethics expert Dr. Martin Peterson illustrates the point: he applied precisely the same methodology as Dr. Gardoni, examining the engineering codes of ethics and opining that Defendants did ***not*** violate their duties. *See* Ex. 2 (2023 Peterson Rpt.) at pp.2–3 (overview of Peterson's opinions applying NSPE and ASCE Codes to reach conclusions contrary to those of Drs. Gardoni and Russell). Far from employing some distinct methodology, Dr. Peterson applies the same assessment of engineering codes to a skewed set of facts—the facts as VNA wishes they existed rather than as they actually exist. Class Plaintiffs look forward to cross-examining Dr. Peterson at trial, and are considering calling him affirmatively given that he used precisely the same method as Dr. Gardoni. Dr. Peterson's report underscores that whatever disagreements Defendants have with the engineering ethics opinions offered by Class Plaintiffs' experts are issues subject to cross-examination at trial and decision by the jury.

a. Drs. Gardoni and Russell are qualified to provide their respective opinions regarding engineering ethical codes and the standard of care.

LAN's first argument heading states that "Gardoni and Russell are unqualified." *See* ECF No. 2474, PageID.81759. However, LAN's brief makes no argument whatsoever regarding Dr. Russell's qualifications—LAN does not even mention Dr. Russell in this section of its brief. *See id.*, PageID.81759–762. LAN has thus waived any new arguments regarding Dr. Russell's qualifications.

With respect to Dr. Gardoni, LAN and VNA both acknowledge this Court's finding that "Dr. Gardoni is [em]inently qualified to talk about the ethical standards that all engineers should hold themselves to." ECF No. 2460 (2023 VNA Gardoni Brief), PageID.79492–93 (quoting Mot. Hearing Tr. (May 19, 2021), ECF No. 1785, PageID.63705, 63790)); *see* ECF No. 2474 (2023 LAN Mot. to Exclude Gardoni and Russell), PageID.81759 ("LAN recognizes that the Court has previously said Gardoni is qualified to express opinions in the field of engineering ethics."). Yet both LAN and VNA dedicate sections of their respective briefs to relitigating his qualifications. Class Plaintiffs have already explained Dr. Gardoni's extensive qualifications—and their superiority over even those of Defendants' experts—in its prior briefing. *See* ECF No. 1533, PageID.59026–031. Nothing in either of Defendants' new briefs undermines Dr. Gardoni's expertise in the field of engineering ethics or his qualifications to offer the opinion set forth in his report.

VNA's motion contains a new paragraph arguing that the Court's acceptance of Dr. Gardoni's qualifications was incorrect because his expertise in engineering ethics does not qualify him to opine regarding the ethical standards that apply to engineers working on "water treatment and distribution." ECF No. 2460, PageID.79493. This ignores the Court's express finding that Dr. Gardoni is "eminently qualified" to address the "ethical standards that ***all*** engineers should hold themselves to." ECF No. 1785 (May 19, 2021 Hearing Trans.), PageID.63790 (emphasis added, spelling corrected). VNA's cited cases do not support a contrary conclusion because each dealt with significant differences between an expert's knowledge relevant to a general field, versus the expert's knowledge applicable to the issue on which the expert was opining. *See In re Whirlpool Corp. Front-Loading Washer Prod. Liab. Litig*., 45 F. Supp. 3d 724, 738 (N.D. Ohio 2014) (aerospace engineering expert could not testify about mold build-up where he lacked adequate knowledge of relevant biology concepts); *Counts v. Gen. Motors, LLC*, 606 F. Supp. 3d 547, 585–86 (E.D. Mich. 2022) (expert with general training in automotive and mechanical engineering could not opine specifically on the validity of portable emissions measurement system testing where he lacked any education or experience with such testing, but ***could*** otherwise testify on vehicle emissions issues). Indeed, VNA's own quoted passage from *Everlight Elecs. Co. v. Nichia Corp*. states that ***"[u]nless [the witness] is to testify only to general engineering principles that any***

mechanical engineer would know, the engineer must possess 'some special skill, knowledge or experience,' concerning the particular issue before the court." ECF No. 2460, PageID.79493 (quoting *Everlight Elecs. Co. v. Nichia Corp*., 2014 WL 4707053, at *9 (E.D. Mich. Sept. 22, 2014) (emphasis added)). Precisely. The ethical principles Dr. Gardoni applies are those that ***any*** professional engineer should know. Dr. Gardoni is well-qualified to opine on their application to the professional engineers in this case.

VNA's motion otherwise reasserts its arguments regarding Dr. Gardoni's purported lack of experience, which Class Plaintiffs previously addressed, and its claim that Dr. Gardoni improperly relied on Dr. Russell. This Court has already stated clearly (and correctly) that an expert may rely upon other experts. ECF No. 1785, PageID.63792 ("The answer is yes. I mean, experts rely on other experts. . ."); *supra*, § II(C). The cases VNA cites do not stand for the proposition that an expert cannot ***rely on*** opinions of another expert, but rather that they cannot act as a mouthpiece to provide opinions in place of another expert. *See Dura Auto. Sys. of Ind., Inc. v. CTS Corp*., 285 F.3d 609, 614 (7th Cir. 2002) (a non-testifying expert cannot "hide behind" a testifying expert, and if his or her study raises questions then "the author would have to testify"); *In re Welding Fume Prod. Liab. Litig.*, 2010 WL 7699456, at *63 (N.D. Ohio June 4, 2010) (excluding expert who was "offering testimony to a jury solely to endorse the opinions of [other] specialists"); *Mike's*

Train House, Inc. v. Lionel, L.L.C., 472 F.3d 398, 409 (6th Cir. 2006) (excluding expert testimony that asserted another expert's conclusions as support for his own where the other expert's opinions were not part of the record).

LAN echoes VNA's incorrect argument that lack of specialization in public water drinking systems renders Dr. Gardoni unqualified to speak to the ethical standards that apply to professional engineers generally. However, LAN takes this point further and argues that LAN's disagreement with Dr. Gardoni's conclusions themselves demonstrate his lack of qualifications. ECF No. 2474, PageID.81760-62. Specifically, LAN characterizes Dr. Gardoni's deposition testimony as requiring more action than would be required by the Lead and Copper Rule ("LCR"), *id*.; but LAN's brief both mischaracterizes the testimony and fails to identify any issue that would warrant exclusion in any event. Dr. Gardoni testified that because the EPA has stated that "no level of lead is safe" and engineers have an obligation to hold the safety of the public paramount, indications of lead warrant "further investigations." Ex. 3 (Gardoni Dep.) at 528:18–529:12. He made clear he was not providing an opinion on the requirements of the LCR, *id*. at 528:18–20, and his report further explains that regulations such as the LCR do not define the standard of care applicable to professional engineers, ECF No. 1208-114 (Gardoni Rpt.), PageID.37164. LAN may disagree with Dr. Gardoni on all of this, and it will have

the opportunity to do so on cross-examination at trial. Its disagreement with his conclusions does not render him unqualified to testify.

b. Testimony regarding engineering codes of ethics is relevant to the standard of care.

Despite saying it will not belabor the point regarding whether engineering ethics codes are relevant to the standard of care, LAN's brief does just that, albeit no more successfully than in the last round of briefing. VNA makes a version of the same argument—which it too previously raised—claiming that Dr. Gardoni has turned voluntary codes of ethics into mandatory standards of care. ECF No. 2460, PageID.79500–01. These arguments misconstrue Dr. Gardoni's opinion: he does not opine that the engineering codes of ethics are drafted to serve as the governing standard of care, but rather that those codes reflect the standards that evolve in the industry. ECF No. 1208-114 (Gardoni Rpt.), PageID.37163. The Court aptly summarized this point at the hearing on Defendants' *Daubert* motions at the class certification stage:

> So the standard of care is set by practitioners in the field and that consensus is then reflected and written down in the codes. So the codes are a place to draw upon the consensus that's been reached in the field. . . . He's not creating a cause of action in the codes. He's not creating the standard of care by referencing canon number two or three. He's saying that canons exist because they're how we do our—they are the way we do our work.

ECF No. 1785, PageID.63767; *see id*. at ECF No. 1785, PageID.63790-91 ("The canons themselves are the summary of what happens in the field and what is required

of professional engineers based on what they actually do on a day-to-day basis, rather than the other way around."). The Court's summary succinctly captures why his testimony is relevant to the standard of care, and the cases Defendants cite do not undermine that conclusion.

Defendants' own witness testimony underscores that the ethical codes applied by Dr. Gardoni reflect a broad and long-standing consensus regarding the standard of care. For instance, VNA engineer Depin Chen confirmed that the "health, safety, and welfare of the public" are and should be his priority when conducting his professional engineering work. Ex. 4 (Chen Dep.) at 25:11–26:3 (*compare* ECF No. 1208-114 (Gardoni Rpt.), PageID.37164, applying principle from ASCE and NSPE Codes that "[e]ngineers must hold paramount the safety, health, and welfare of the public"). Chen further agreed that, as a licensed engineer, he has "an obligation to notify [his] employer or [his] client if [his] professional judgment is overruled and the health, safety, and welfare of the public is endangered," Ex. 4 (Chen Dep.) at 27:2–11 (*compare* ECF No. 1208-114 (Gardoni Rpt.), PageID.37168, applying principle from ASCE and NSPE Codes that "Engineers have the duty to inform their client and employer of the consequences if their judgment is overruled"). These obligations are among those set forth in the Model Rules promulgated by the National Council of Examiners for Engineering and Surveying (NCEES), meaning every licensed professional engineer in the State of Michigan (and all other states)

is tested on them. *See* Ex. 4 (Chen Dep.) at 18:6–19:23. They are, along with numerous other provisions common to engineering ethics model rules and codes, reflected in the ASCE and NSPE Codes of Ethics applied by Dr. Gardoni, underscoring that the ASCE and NSPE Codes embody the broad consensus in the profession regarding the obligations of professional engineers.

Class Plaintiffs' prior briefing cited numerous courts that have held expert testimony regarding ethical standards relevant and admissible, including one affirming admission of testimony that applied one of the same engineering codes at issue here, *see Post Office v. Portec, Inc*., 913 F.2d 802, 807 (10th Cir. 1990) (affirming admission of testimony regarding the NSPE Code of Ethics); *see also John T. Jones Const. Co. v. Hoot Gen. Const*., 543 F. Supp. 2d 982, 1010 (S.D. Iowa 2008), *aff'd*, 613 F.3d 778 (8th Cir. 2010) (citing ASCE Ethics Code canons as relevant to ascertaining standard of care relevant to professional negligence claim against engineers); ECF No. 1533 (Plaintiff's Opp. to Mot. to Strike Gardoni and Russell), PageID.59032–34 (collecting cases allowing experts in various fields to testify regarding ethical standards). And as noted already, VNA's own expert applied precisely the same codes to conclude that VNA acted "in an appropriate manner." *See* Ex. 2 (2023 Peterson Rpt.) at p.17.

VNA nevertheless cites *In re Welding Fume Products Liability Litigation*, 2005 WL 1868046 (N.D. Ohio Aug. 8, 2005) for the proposition that ethical

standards are not relevant to ascertaining legal standards, ECF No. 2460, PageID.79502–03; but this is the same inapposite case that Defendants previously cited at the class certification stage, in which the opinions being offered consisted of vague ethical principles that the expert himself had invented—not a set of principles delineated by the leading professional organization in that particular field. *See* ECF No. 1533, PageID.59035. Class Plaintiffs have likewise already addressed the additional cases VNA cited,[3] and respectfully refer the Court to that prior briefing. *See id*., PageID.59034–35.

LAN cites to Dr. Marc Edwards' testimony in which he purportedly determined "from 'the entire body of evidence' that 'there is no way' to say that LAN 'behaved unethically,'" ECF No. 2474, PageID.81764, but Dr. Edwards' disagreement with Dr. Gardoni's and Dr. Russell's respective conclusions does not render their testimony regarding engineering codes irrelevant. *See supra*, § II(D).

Finally, LAN claims that testimony regarding ethics in engineering should be excluded as more prejudicial than probative under FRE 403. ECF No. 2474, PageID.81765. Far from it: balancing probative value against potential prejudice makes clear that this testimony must be admitted. With regard to expert testimony addressing the standard of care for engineers, as this Court stated, "Michigan law

[3] These are *Malinski v. BNSF Ry. Co.*, 2017 WL 1278671, at *3 (N.D. Okla. Mar. 31, 2017) and *Concord Boat Corp. v. Brunswick Corp.*, 1998 WL 3254137, at *1 (E.D. Ark. Mar. 2, 1998), cited by VNA at ECF No. 2460, PageID.79503.

requires it." ECF No. 1785, PageID.63792. Dr. Gardoni and Dr. Russell offer that required testimony, grounded in extensive expertise and clear methodologies replicated by Defendants' own experts. On the other side of the scale, LAN suffers no prejudice from testimony that helps inform the jury regarding the standard of care applicable to professional engineers. LAN repeatedly argues that ethical principles cannot serve as a stand-in for the standard of care, but neither Dr. Gardoni nor Dr. Russell state otherwise. To the contrary, Dr. Gardoni repeatedly stated at his deposition that the engineering standard of care "is not in the form of a cookbook" that can be rotely applied without due consideration of the factual circumstances. Ex. 3 (Gardoni Dep.) at 533:11–15; *see id*. at 531:9–10, 534:10, 535:9–11.

When LAN previously argued that the ethical codes are not themselves a standard, this Court stated, "I'm not using the codes as a standard of care," and "the report may provide some information about whether there was a violation of the professional responsibility that the engineers had." ECF No. 1785, PageID.63790. A jury can easily be instructed that the ethical codes themselves do not constitute the standard of care: indeed, such an instruction is precisely what the Tenth Circuit found defendants could have requested in *The Post Office v. Portec*. 913 F.2d at 807 n.1. No valid basis exists for preventing the jury from hearing expert testimony regarding the ethical codes applicable to engineers offered by both sides.

c. Dr. Gardoni and Dr. Russell applied their education, training, and experience regarding engineering ethics and the standard of care to the facts of this case.

The Court has already rejected Defendants' argument that Dr. Gardoni supposedly failed to address evidence regarding other actors that LAN and VNA would like to blame for the harm they caused in Flint. As the Court stated with respect to Dr. Gardoni at the May 25, 2021 hearing,

> He's in the field of engineering and not in the field of governing and he wasn't asked to evaluate whether [the Governmental Defendants] met their professional responsibilities. . . . [H]e's got a section on LAN and a section on VNA and thank goodness he doesn't give us an opinion on anyone else in this. . . . So I don't see a problem with him not talking about what should MDEQ have done, what should the emergency manager have done.

ECF No. 1785, PageID.63773. The Court has acknowledged that the standard of review for expert testimony differs at the class certification and pre-trial stages; but the fact that as a professor in the field of ***engineering***, Dr. Gardoni appropriately focused his report on the ***Engineering*** Defendants, is not impacted by any difference between those standards. Under any review standard, Dr. Gardoni's report must be within the scope of his expertise and based on sufficient facts in light of that scope. The Court has correctly found that Dr. Gardoni's report meets that requirement. And Dr. Russell is likewise an engineer tasked with, among other things, opining on the standard of care in that field and his report similarly focuses on the acts and omissions of the Engineering Defendants.

LAN nevertheless argues that both Dr. Gardoni and Dr. Russell "consciously and deliberately avoided looking at the actions of anyone other than LAN or VNA," ECF No. 2474, PageID.81766, and VNA asserts the same point with respect to Dr. Gardoni, accusing him of setting out with the purpose of pinning blame on the Engineering Defendants, ECF No. 2460, PageID.79496–79500. VNA's arguments are copied from its previous motion, and Class Plaintiffs thus incorporate by reference their prior response explaining why these arguments fail to raise any basis for exclusion. *See* ECF No. 1533 (Class Plaintiff's Opp. to Defs.' Mot. to Exclude Gardoni and Russell), PageID.59042–48. LAN likewise borrows many of its arguments from its prior motion, and Class Plaintiffs again direct the Court to their prior response. *See id*.

Fundamentally, both LAN and VNA criticize Dr. Gardoni's and Dr. Russell's conclusions on the basis that they did not review documents that LAN and VNA would like to argue exonerate them for their conduct in Flint. Defendants have themselves cherry-picked self-serving documents and testimony and presented them without context to try to undermine those conclusions, all while accusing Drs. Gardoni and Russell (and counsel for Class Plaintiffs) of selectively choosing evidence to consider. But quibbling over what evidence should have been reviewed by Dr. Gardoni and Dr. Russell misses the point. An expert must apply their

methodology to sufficient facts of the case, and both Dr. Gardoni and Dr. Russell have done so.

Dr. Gardoni reviewed, for instance, emails and meeting records from the relevant period, the deposition transcripts of VNA's lead engineer Marvin Gnagy and LAN engineer Steven Luoma, and—perhaps most notably—LAN's and VNA's detailed discovery responses in which Defendants cite and describe the evidence that they believe demonstrates their adequate performance of their duties. *See* ECF No. 1208-114 (Gardoni Rpt.), PageID.37174–76. For instance, in response to Class Plaintiffs' interrogatory asking LAN to "[i]dentify and describe any warnings, advisories or other information provided by LAN to the City of Flint regarding the water supply, including but not limited to communications regarding the presence of lead or Total Trihalomethanes (TTHM) in the water supply," LAN provided a detailed response spanning eleven single-spaced pages, supported by numerous record citations. Ex. 5, Resp. to Rog. #2. It is simply incorrect to say that Dr. Gardoni only reviewed material selected by Class Plaintiffs' counsel: he reviewed the explanations of Defendants' conduct that ***Defendants themselves*** supplied. As for Dr. Russell, he too reviewed Defendants' discovery responses, along with depositions of the Engineering Defendants' engineers and businesspeople, and multiple engineering studies and reports. ECF No. 1208-67 (2020 Russell Rpt.), PageID.35491–96. Indeed, LAN cites to the conclusions set forth in the Flint Water

Advisory Task Force Report as purported support for its argument that Dr. Russell "Intentionally Disregarded Relevant Evidence," ECF No. 2474, PageID.81765, 81765, but Dr. Russell ***reviewed that very report***, *see* ECF No. 1208-67 (2020 Russell Rpt.), PageID.35495.

Having grounded their opinions in the evidentiary record, whether Dr. Gardoni and Dr. Russell should have also considered different facts in the record that Defendants believe support their case is a quintessential point for cross-examination. Rule 702 "does not require that an expert consider all relevant evidence. It only requires the expert's testimony to be based on sufficient facts and data to make the testimony reliable." *Rich v. City of Savannah*, 2005 WL 6739798, at *3 (W.D. Tenn. Aug. 25, 2005). Defendants can challenge Dr. Gardoni's and Dr. Russell's "opinion[s] by vigorous cross-examination and the presentation of contrary evidence." *Id.*; *see also Walker v. Gordon*, 46 F.App'x 691, 695–96 (3d Cir. 2002) ("An expert is, nonetheless, permitted to base his opinion on a particular version of disputed facts and the weight to be accorded to that opinion is for the jury. It is also, as the District Court observed, a proper subject for cross-examination").

Moreover, even were the factual bases for Dr. Gardoni's and Dr. Russell's respective reports relatively thin (they are not), this Court has rightly noted that "the Sixth Circuit has repeatedly clarified, 'it is not proper for the Court to exclude expert testimony 'merely because the factual bases for an expert's opinion are weak.'" *In*

re Flint Water Cases, No. 17-10164, 2022 WL 189503, at *2 (E.D. Mich. Jan. 20, 2022) (quoting *Andler v. Clear Channel Broad., Inc.*, 670 F.3d 717, 729 (6th Cir. 2012)); *see also In re Scrap Metal*, 527 F.3d at 531–32. Both Dr. Gardoni and Dr. Russell have applied reliable methodologies to the particular facts of this case. If there is evidence that LAN believes undercuts their opinions, "LAN may present such evidence at trial." *In re Flint Water Cases*, 2022 WL 189503, at *2.

In addition to reiterating its old factual points, LAN argues that Dr. Gardoni and Dr. Russell's opinions should be excluded because "Marc Edwards provides a more objective evaluation" of the factual record. ECF No. 2474, PageID.81771. This critique—that LAN's favored witness has analyzed the record and reached a different conclusion from that of Class Plaintiffs' experts—has been consistently rejected by courts as a basis for exclusion and simply underscores the need to submit the issue to a jury. *See supra*, §§ II(D)-(E) (disagreements on conclusions and battles between experts do not warrant exclusion but must go before the jury). LAN nevertheless claims, without citation, that the Court "can consider [Edwards'] testimony in evaluating the reliability and admissibility of Gardoni and Russell's testimony for purposes of *Daubert* and Rule 702." ECF No. 2474, PageID.81772. The law does not support excluding an expert's opinion as "unreliable" because a witness disagrees with the expert's conclusions, and LAN cites no authority stating otherwise.

Defendants' motions provide Defendants with a draft of their eventual cross-examination of Dr. Gardoni and, in the case of LAN, of Dr. Russell. But nothing in their briefs warrants denying the jury the benefit of Class Plaintiffs' expert testimony regarding ethical codes and the standard of care for professional engineers.

d. VNA and LAN's additional re-raised arguments are yet more attacks on conclusions rather than methodology and do not support exclusion.

The remaining arguments VNA and LAN assert again attack conclusions rather than methodologies, and Defendants previously raised each of those arguments prior to class certification. Their arguments did not justify exclusion then, nor do they now: an attack on conclusions does not warrant exclusion at any stage or under any standard. *See supra*, §§ II(D)-(E). Because these arguments have already been litigated Class Plaintiffs do not dwell on them, but rather provide the following summary and note the relevant prior briefing.

VNA argues once again that Dr. Gardoni should have given more weight to two code provisions—those (1) stating that engineers act as faithful agents to their clients and (2) requiring engineers to act only with knowledge of the facts. ECF No. 2460, PageID.79503–08. VNA's own brief highlights that this criticism is yet another attack on conclusions rather than methodology: VNA argues that Dr. Gardoni ignored the provision regarding faithfulness to clients, but in the ***very same paragraph*** cites the portion of Dr. Gardoni's report where Dr. Gardoni directly

quotes the supposedly "ignored" requirement. ECF No. 2460, PageID.79504. VNA's quarrel lies with his conclusion, not his method. Class Plaintiffs respectfully refer the Court to their prior briefing for a further response to VNA's recycled arguments regarding additional code provisions VNA believes obviate its liability. *See* ECF No. 1533, PageID.59041–42.

LAN's renewed motion gestures to "other specific parts of the ASCE or NSPE codes of ethics" that it claims "have no application here" and asks the Court to exclude any testimony on these vaguely-referenced provisions based on its prior briefing. *See* ECF No. 2474, PageID.81772. However, if LAN truly believes that the code provision requiring, for instance, engineers to "[b]e truthful and honest" has "no application" to this case, it should have to make that argument to the jury. *See* ECF No. 1388, PageID.53278.[4] LAN repeatedly argues with the conclusions Dr. Gardoni reached when applying various code provisions, citing its own expert Dr. Jordan for the assessment that "Gardoni's analysis reflect[s] 'a fundamental misconception' of the codes." ECF No. 1388, PageID.53277. Once again, the weight to be given one expert's conclusions over another is the province of the jury. *See* supra, § II(E); *see also* ECF No. 1533 (Class Plaintiffs Resp. to Mot. to Exclude

[4] To be clear, the requirement that engineers be truthful and honest—i.e., conform their statements to the facts available to them—is distinct from the question of Defendants' motive or mental state, which neither Dr. Russell nor Dr. Gardoni will opine on at trial.

Gardoni and Russell), PageID.59039–42 (discussing shared methodologies but differing conclusions of Dr. Gardoni and LAN expert Dr. Jordan). And with regard to LAN's claim that Dr. Gardoni and Dr. Russell have fabricated a "whistleblowing" requirement, Dr. Gardoni simply discusses and applies the code provisions requiring engineers to "inform their client and employer of the consequences if their judgment is overruled," ECF No. 1208-114 (Gardoni Rpt.), PageID.37168: as Dr. Gardoni explains, "Gnagy and Chen [VNA Engineers] should have voiced their concerns when Nicholas overruled their judgment due to business development concerns," and he colloquially describes their failure to do so as a failure to "blow the whistle." *Id.*, PageID.37183. As noted above, Mr. Chen ***agreed*** in his deposition that he had an "obligation to notify [his] employer or [his] client if [his] professional judgment is overruled and the health, safety, and welfare of the public is endangered." Ex. 4 (Chen Dep.) at 27:2–11. LAN's attempt to run away from its obligations by recasting Dr. Gardoni's report into something made up out of whole cloth should be disregarded.

LAN and VNA offer no valid basis for excluding the engineering ethics opinions of Dr. Gardoni and Dr. Russell. Their respective motions should be denied.

2. Dr. Larry Russell's Pipe Analysis

VNA, unlike LAN, has not moved to exclude Dr. Russell's opinion regarding engineering ethics and the Engineering Defendants' failure to meet the standard of

care. Rather, VNA seeks to exclude only Dr. Russell's analysis of copper and galvanized steel piping at the homes of two named plaintiffs—the same homes at which VNA previously performed its own inspection of piping and fixtures. VNA's motion yet again attacks conclusions rather than methodologies, misconstrues Dr. Russell's opinion, and ultimately provides no basis to exclude his testimony.

VNA performed its own pipe inspection at the homes of Rhonda Kelso and Barbara and Darrell Davis in October 2020. Dr. Russell was unable to participate in these inspections due to the COVID-19 pandemic. Instead, he performed his own inspection in February 2022 and provided a report on that inspection in October 2022. ECF No. 2454-3, PageID.77636. During his February 2022 inspection, Dr. Russell located pipe segments identified in VNA's prior report to have them removed by a licensed plumber and transported under Dr. Russell's supervision to a metallurgical lab for analysis. *Id.*, PageID.77659, 77663.

Once back at the laboratory, Dr. Russell performed visual, microscopic, and scanning electron microscopic evaluation of the extracted copper and galvanized steel pipe segments. *Id*. His examination showed evidence supporting his prior opinion that the water during the Flint Water Crisis was capable of damaging pipes and fixtures: it had in fact done so. Specifically, he observed that the copper piping from both homes had lost at least 0.002 inches of wall thickness, having shrunk from the industry standard nominal thickness of 0.028 inches to 0.026 inches (and, in the

case of one hot water pipe, having lost wall thickness down to 0.019 inches). *Id*., PageID.77659, 77663. With respect to the galvanized steel pipe, he observed through wall pits with remaining wall thickness near zero. *Id*., PageID.77664. He also found that the steel pipe fittings were heavily tuberculated with iron oxide deposits, with each tubercule consisting of a pit that either has penetrated or will penetrate the wall at some point in time. *Id*. These findings confirm both Dr. Russell's own prior analysis, as well as the work of Dr. Marc Edwards, who reported that during the 16-month period of exposure during the Flint Water Crisis, the pipes in Flint would have experienced corrosion damage of approximately 11.5 years (translating to approximately one additional quarter of the original pipe wall thickness being corroded away). *Id*. In short, Dr. Russell's analysis of pipes from the two homes examined by Defendants provides probative evidence corroborating Dr. Russell's opinion that the water in Flint in 2014 and 2015 was capable of causing damage to pipes.

Despite this, VNA seeks to strike Dr. Russell's pipe analysis set forth in his October 2022 Report on three bases, each equally meritless.

First, VNA misapplies the standard for nominal wall thickness of ½-inch Type M copper pipes to argue that the measurements obtained by Dr. Russell actually show no damage at all. *See* ECF No. 2454, PageID.77619–622. However, putting aside that VNA's analysis rests on a misunderstanding of the standard and

the use of sub-standard methods by its own expert, VNA's argument presents the sort of battle of the experts that falls squarely within the province of the jury.

Second, VNA argues that Dr. Russell cannot pinpoint when pipe corrosion actually occurred. *Id*., PageID.77622–25. But VNA's argument both ignores other evidence relevant to the likely timing of the corrosion and merely underscores Dr. Russell's point: if previously-provided water, which was ***less*** corrosive than the water during the Flint Water Crisis, was capable of causing harm, then the ***more*** corrosive water provided during the crisis certainly was too.

Third, VNA claims that Dr. Russell's "sample size" was too small and that his opinion regarding City-wide harm is irrelevant. VNA's criticism of Dr. Russell's choice to analyze the homes of two named plaintiffs ignores that (1) he made this choice based on Defendants' own analysis of those same homes and their pipes, and (2) his analysis serves as corroborating evidence for his prior opinion—and will be extremely helpful for lay jurors to hear and see in order to better understand his technical opinions—but it is far from his sole support for his opinion that Flint water in 2014 and 2015 was capable of causing harm. And the notion that demonstrating that the water ***in fact*** caused widespread harm is irrelevant to whether that water was ***capable*** of causing harm belies logic. VNA's motion should be denied.

a. VNA's attack on Russell's opinion regarding copper pipe wall thickness mischaracterizes the record and attacks conclusions rather than methodology.

VNA's argument that Dr. Russell used an "unreliable" methodology for his copper pipe analysis because his measurements are supposedly within the allowable tolerance for copper piping misstates the facts and, in any event, does not provide a basis for exclusion: the disagreement between Dr. Russell and VNA's expert is one for the jury to decide.

Dr. Russell measured the wall thickness of the pipes in the Kelso and Davis residences as nearly all 0.026 inches, which is 0.002 inches less than the 0.028 inch nominal thickness for ½-inch Type M copper pipes—the standard to which those pipes are manufactured. ECF No. 2454-3 (Oct. 2022 Russell Rpt.), PageID.77659–664. Nevertheless, VNA points to a table from ASTM that indicates a "tolerance" for such pipes as 0.003 and argues that therefore pipes measuring 0.026 inches thick are "indistinguishable from new, off-the-shelf copper pipe." ECF No. 2454, PageID.77621–22. However, the "tolerance" cited by VNA is for "***deviation[s]***" in thickness at "***at any one point***"—not the pipe's entire baseline wall thickness. Rather, pipes are manufactured to the standard (0.028 inches thick), and deviations are measured (and allowable) in relation to the thickness of the pipe's baseline thickness due to the method of manufacturing. A uniformly 0.026-inch-thick pipe

does not have "deviation[s]" from its standard thickness; it is simply below the standard manufacturing requirement.

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TABLE 1 Dimensions, Weights, and Tolerances in Diameter and Wall Thickness for Nominal or Standard Copper Water Tube Sizes
(All tolerances are plus and minus except as otherwise indicated)

Nominal or Standard Size, in.	Outside Diameter, in.	Average Outside Diameter[A] Tolerance, in.		Wall Thickness and Tolerances, in.						Theoretical Weight, lb/ft		
				Type K		Type L		Type M				
		Annealed	Drawn	Wall Thickness	Tolerance[B]	Wall Thickness	Tolerance[B]	Wall Thickness	Tolerance[B]	Type K	Type L	Type M
¼	0.375	0.002	0.001	0.035	0.0035	0.030	0.003	[C]	[C]	0.145	0.126	[C]
⅜	0.500	0.0025	0.001	0.049	0.005	0.035	0.004	0.025	0.002	0.269	0.198	0.145
½	0.625	0.0025	0.001	0.049	0.005	0.040	0.004	0.028	0.003	0.344	0.285	0.204
⅝	0.750	0.0025	0.001	0.049	0.005	0.042	0.004	[C]	[C]	0.418	0.362	[C]
¾	0.875	0.003	0.001	0.065	0.006	0.045	0.004	0.032	0.003	0.641	0.455	0.328
1	1.125	0.0035	0.0015	0.065	0.006	0.050	0.005	0.035	0.004	0.839	0.655	0.465
1¼	1.375	0.004	0.0015	0.065	0.006	0.055	0.006	0.042	0.004	1.04	0.884	0.682
1½	1.625	0.0045	0.002	0.072	0.007	0.060	0.006	0.049	0.005	1.36	1.14	0.940
2	2.125	0.005	0.002	0.083	0.008	0.070	0.007	0.058	0.006	2.06	1.75	1.46
2½	2.625	0.005	0.002	0.095	0.010	0.080	0.008	0.065	0.006	2.93	2.48	2.03
3	3.125	0.005	0.002	0.109	0.011	0.090	0.009	0.072	0.007	4.00	3.33	2.68
3½	3.625	0.005	0.002	0.120	0.012	0.100	0.010	0.083	0.008	5.12	4.29	3.58
4	4.125	0.005	0.002	0.134	0.013	0.110	0.011	0.095	0.010	6.51	5.38	4.66
5	5.125	0.005	0.002	0.160	0.016	0.125	0.012	0.109	0.011	9.67	7.61	6.66
6	6.125	0.005	0.002	0.192	0.019	0.140	0.014	0.122	0.012	13.9	10.2	8.92
8	8.125	0.006	+0.002 −0.004	0.271	0.027	0.200	0.020	0.170	0.017	25.9	19.3	16.5
10	10.125	0.008	+0.002 −0.006	0.338	0.034	0.250	0.025	0.212	0.021	40.3	30.1	25.6
12	12.125	0.008	+0.002 −0.006	0.405	0.040	0.280	0.028	0.254	0.025	57.8	40.4	36.7

[A] The average outside diameter of a tube is the average of the maximum and minimum outside diameter, as determined at any one cross section of the tube.
[B] Maximum deviation at any one point.
[C] Indicates that the material is not generally available or that no tolerance has been established.

ECF No. 2454-6, PageID.77748 (highlighting added). This is confirmed by the *Industry Standard Guide for the Design and Installation of Copper Piping Systems* published by the Copper Development Association, which provides 0.028 as the nominal dimension for ½-inch thick copper tubes, Type M. *See* Ex. 6, Table 14.2c. In other words, it is VNA's expert, Dr. Crowe, not Dr. Russell, who misreads the standard. Accordingly, when Dr. Russell referred to the "minimum thickness" that a manufacturer would use at his deposition, he was referring to the nominal or standard thickness of 0.028, not the tolerance for point deviations from the rest of the pipe.

Dr. Crowe's purported measurement of a newly-bought ½-inch Type M copper pipe as 0.026 inches thick does not undermine Dr. Russell's correct application of the standard. *See* ECF No. 2454, PageID.77620–21. As Dr. Russell's March 3, 2023 report explains, Dr. Crowe's pipe-thickness measurements are unreliable because Dr. Crowe used improper tools to obtain them. ECF No. 2454-5, PageID.77733. While Dr. Russell used a Mitutoyo micrometer calibrated with precision gauge blocks for all pipe-thickness testing—which is the proper metallurgical point micrometer to acquire accurate measurements—Dr. Crowe performed his pipe-thickness measurements with "a Home Depot or Harbor Freight quality tool, which is neither of proper quality or design to make the assessments that Dr. Crowe has presented" with regard to his measurements of pipe samples taken from residents homes. *Id*. Dr. Crowe's pipe measurements are consequently inadequate and likely inaccurate. *Id*. Dr. Crowe used the same sub-standard equipment to perform his measurements of new, off-the-shelf copper pipes, ECF No. 2454, PageID.77621; *see* ECF No. 2454-7, PageID.77766 (Crowe Report showing plastic calipers used to measure new pipe), and the same measurement defect applies. The problem of using inaccurate plastic calipers designed for hobbyists rather than a point micrometer is compounded by the fact that calipers such as those Dr. Crowe used only permit measurement at the end of the pipe near the cut, and the very act of cutting the pipe will create deviations that would not otherwise be present

(as Dr. Russell explains, accurate measurement requires "measur[ing] at several locations along the pipe"). ECF No. 2454-5, PageID.77733.

Despite the plainly inferior tools used by Dr. Crowe, Class Plaintiffs opted not to move to exclude his testimony because they understand what VNA repeatedly fails to appreciate: disagreements between experts are the province of the jury. *See e.g.*, *United States v. Turner*, 287 F.App'x 426, 434 (6th Cir. 2008) (disagreement over requirements for matching up boot prints were "differences of opinion between the experts that the jury must weigh, not a court"); *supra* § II(E). VNA's complaint about Dr. Russell's pipe measurements is the quintessential dispute with an expert's conclusion—in this instance, the conclusion that an accurate pipe thickness reading of 0.026 inches demonstrates corrosion from the water—not with an expert's methodology of measuring the pipe wall thickness to assess whether any corrosion occurred. Dr. Crowe conducted the same analysis, applying an incorrect reading of the standard and using inferior tools, and reached a different conclusion. The jury can decide whose testimony to credit.

b. Dr. Russell applied reliable methods to opine that the corrosive water conditions in Flint were capable of damaging steel and copper pipes.

Dr. Russell's findings in his steel and copper pipe analysis corroborate and confirm the opinion he offered in his original report: that the water conditions in Flint during 2014 and 2015 were capable of causing harm to pipes. VNA criticized

Dr. Russell's 2020 report on multiple (meritless) bases, including that Dr. Russell should have physically inspected pipes at the homes of the named plaintiffs (which Dr. Russell was unable to do due to the then-ongoing COVID-19 pandemic). Now that he has performed the analysis VNA demanded, VNA complains that the results of his analysis be kept from the jury. In particular, VNA argues that while water may have caused through-wall pitting of galvanized steel pipes and loss of wall thickness of copper pipes, it might have done so at some time other than 2014 and 2015. VNA's bid to avoid Dr. Russell's probative testimony fails both on the facts and the law.

First, as a factual matter, VNA is incorrect that Dr. Russell has no basis to opine on when the damage to galvanized steel and copper piping occurred. Dr. Russell's 2020 report explains in detail how corrosive water conditions, measured by Marc Edwards' team in Flint during the water crisis, would lead to damaged pipes. ECF No. 1208-67 (2020 Russell Rpt.), PageID.35428, 35434, 35443–455. VNA makes much of the age of the steel pipes at the Kelso home, speculating that the corrosion Dr. Russell observed could have occurred at some point in the past; but the very age of these pipes establishes the contrary. As Dr. Russell explains, corrosion of steel pipes drastically cuts their expected lifespan. ECF No. 1208-67 (2020 Russell Rpt.), PageID.35484. Had these pipes been exposed decades ago to highly corrosive water such as existed during the water crisis—for which the

"corrosion rate is estimated to have been up to 8.6 times faster than what was experienced on the DWSD water"—those pipes could not possibly have survived to the present. *Id*. Their very age confirms that the severe corrosion did ***not*** occur decades in the past.

Second, whether Dr. Russell can exclude the possibility of damage to the examined pipes at some time before or after the Flint Water Crisis is irrelevant given the purpose for which he offers his pipe analysis testimony. VNA treats Dr. Russell's pipe examination as the sole basis for his opinion that the harmful water conditions in Flint during 2014 and 2015 were capable of damaging residential pipes. It is not. *See* ECF No. 2454-5 (2023 Russell Rpt.), PageID.77738 (explaining that the pipe analysis is additional, rather than the sole, evidence supporting that the corrosive water conditions LAN and VNA caused were capable of causing harm and referring to his 2020 report). Rather, Dr. Russell's 2020 report sets forth a detailed explanation, based on well-documented principles of water chemistry, of how water can cause corrosion of galvanized steel and copper piping and how that analysis applies to the piping in Flint. ECF No. 1208-67 (2020 Russell Rpt.), PageID.35443–455, 35476–489. Dr. Russell's analysis of both copper and galvanized steel pipes corroborates his opinion regarding the capacity for the water provided to Flint in 2014 and 2015 to cause harm, as his examination of piping from the Davis and Kelso homes revealed the damage that his report predicted one would find. *See generally*

ECF No. 2454-3 (Oct. 2022 Russell Rpt.), PageID.77659–672. By contrast, had his examination of the pipes shown no damage, that would have demonstrated that his opinion was incorrect—that is, in fact, the analysis and opinion being offered by VNA's own expert Dr. Crowe. This underscores that the issue here is one of competing conclusions.

VNA's cited cases excluding expert testimony that was based purely on speculation and conjecture or that "fail[ed] to 'rule out other possible causes,'" are inapposite, ECF No. 2454, PageID.77625: Dr. Russell's opinion that the harmful water conditions in Flint were capable of damaging galvanized steel and copper pipes is supported by robust analysis, *see* ECF No. 1208-67 (2020 Russell Rpt.), PageID.35443–454, 35475–490; *see also* ECF No. 2454-3 (Oct. 2022 Russell Rpt.), PageID.77672 (citing corroborating analysis from Marc Edwards regarding corrosivity of Flint River water), and his pipe examination corroborates that analysis by demonstrating exactly the damage his prior report predicted one would see. As a consequence, VNA's contention that Dr. Russell supposedly cannot speak to when that harm occurred is a point for cross-examination, not a basis for exclusion.

Absent a legal basis to exclude his opinion, VNA's motion repeatedly resorts to mischaracterizing Dr. Russell's testimony. VNA's citation of Dr. Russell's 2022 deposition testimony as "admitting he does not know when the pitting occurred" misrepresents the cited passage: he testified, with respect to a specific through-wall

leak (i.e., a hole), that he had no information as to the moment in time when that particular pitting turned into a through leak—meaning the specific point at which the corrosion wore all the way through the pipe to the point that one could see daylight. *See* ECF No. 2545-4 (2022 Russell Dep.), PageID.77722–23. His opinion makes clear that the corrosion responsible for the ultimate leak likely occurred during the Flint Water Crisis. ECF No. 2454-3, PageID.77672. And VNA's assertion that Dr. Russell "acknowledges that Flint plumbing was exposed to corrosive water for many decades" is misleading, ECF No. 2454, PageID.77624. With respect to his supposed concession that water was drawn from the Flint River prior to 1967, Dr. Russell indeed agrees that Flint River water is corrosive; but VNA ignores that the water provided pre-1967 was stable and had substantially lower chloride concentration due to less winter salt usage and the use of Aluminum Sulfate rather than ferric chloride as their coagulant (unlike the Flint River water provided in 2014 and 2015 which was had much higher chloride concentration). *See* ECF No. 1208-67 (2020 Russell Rpt.), PageID.35420. And with respect to water from Detroit, the relative corrosivity of pre-treatment to post-treatment Detroit water is beside the point. While the former may be more corrosive than the latter, in no case is Detroit water anywhere near as corrosive as the improperly treated Flint River water subsequently provided. *See* ECF No. 1208-67 (2020 Russell Rpt.), PageID.35452.

But VNA's mischaracterizations aside, VNA's argument that water provided prior to April 2014 may have caused corrosion only proves Dr. Russell's point. The purpose of Dr. Russell's testimony is to help the trier of fact determine whether harmful water conditions during the Flint Water Crisis were "***capable of causing harm***" to the galvanized steel and copper pipes in residents' homes. If VNA is correct that corrosive water provided to Flint residents prior to April 2014 caused damage to the pipes, this simply confirms that the answer is "yes," given that the overwhelming evidence demonstrates that water provided in 2014 and 2015 was ***more*** corrosive than any corrosive water previously provided. *See id.* VNA's argument that previously provided, less corrosive water may have also been capable of causing damage to the pipes in Flint is yet another point VNA can raise on cross-examination, should it wish to do so.

c. Dr. Russell appropriately considered the pipe samples from the same homes considered by VNA's expert and his opinion offers probative evidence corroborating his water quality analysis evidencing the water's capacity to cause harm.

VNA's criticism of Dr. Russell for purportedly "extrapolat[ing] from pipe samples taken from one or two residences" to conclude that pipes throughout the City of Flint require replacement fails because it misframes what his analysis shows: the water conditions during the Flint Water Crisis had the capacity to cause harm (as demonstrated by the fact that they did so). ECF No. 2454, PageID.77625. And VNA's assertion that his testimony on the need for citywide remediation is

"irrelevant" fails for the same reason: the need to replace the pipes exposed to harmful water is certainly probative of whether that water was capable of causing damage.

As Dr. Russell explains in his report, it was Defendants who opted to narrowly focus their field analysis on only the piping at the Kelso and Davis homes. ECF No. 2454-3, PageID.77671. When Dr. Russell then set out to conduct his own field work, he "chose to remove pipe sections from those same houses to avoid adding even more variables into the data being collected." *Id*. Ignoring that Dr. Russell simply mirrored the choice made by VNA's own expert, VNA cites caselaw for the proposition that expert testimony is "unreliable" when "there is simply too great an analytical gap between the data and opinion offered," while entirely ignoring the substance of the "opinion offered" by Dr. Russell. ECF No. 2454, PageID.77625 (quoting *Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 146-47 (1997)). But VNA's cited case provides no support for exclusion here. In *Joiner*, the excluded expert had extrapolated his opinion that ***low-dose*** exposure to PCBs could cause cancer in ***humans*** from studies showing that ***high-dose*** injections of PCBs could cause cancer in ***mice***. *Joiner*, 522 U.S. at 144. There is no such "analytical gap" here. Rather, Dr. Russell explained in his prior report that the same corrosive water was provided throughout the City of Flint. *See* ECF No. 1208-67 (2020 Russell Rpt.), PageID.35480. His analysis showing that this water was capable of harming

galvanized steel and copper in one home supports the conclusion that it was capable of harming pipes made of those same materials in another.

With respect to the purported "irrelevance" of Dr. Russell's opinion that pipes across the City of Flint will need replacing due to their exposure to the water during 2014 and 2015, VNA's argument defies common sense. If pipes throughout the city were damaged to the point of requiring replacement, then that fact is certainly probative of whether the water was capable of causing damage. Basic logic dictates that evidence that water ***in fact caused*** harm is probative to the question of whether it is ***capable*** of doing so. And while his prior report provides a technical explanation of why and how the corrosive water provided during the Flint Water Crisis was capable of damaging pipes, the physical illustration of this provided by his pipe analysis will help a lay jury better understand that technical analysis.

VNA's motion to exclude Dr. Russell's analysis of galvanized steel and copper pipes from the Kelso and Davis homes attacks conclusions rather than methodologies, asserts arguments that should be tested on cross-examination, and repeatedly misframes his opinion. VNA's motion should be denied.

3. Dr. Clifford Weisel

Building upon the work of Dr. Russell, Dr. Weisel opines on elevated water lead levels throughout Flint's water distribution system. Dr. Weisel identified that the corrosive water conditions created by Flint's change in water source caused

increases in the levels of lead distributed to homes, recreational facilities, workplaces, restaurants, and schools. ECF No. 2455-3 (2022 Weisel Decl.), PageID.77855–56. Dr. Weisel attributes the findings of soluble and particulate lead in tap water at least in part to the failure to use corrosion control treatment at the time of the switch in the water source to the Flint River, which caused a disruption of the protective layer on the surface of pipes, plumbing fittings, and fixtures. *Id.*, PageID.77863. Dr. Weisel cites a generally recognized American Water Works Association (AWWA) publication which provides that a corrosion control plan is necessary for distribution systems to develop a stable passivation layer and scale deposits to avoid lead leaching into consumer tap water. *Id.*, PageID.77867. He opines that this layer would have been established in Flint in the decades prior to the period at issue because the water sourced from Lake Huron contained a corrosion inhibitor. *Id.*, PageID.77868.

Dr. Weisel relies in part on the analysis of Dr. Russell and testimony of U.S. EPA employee Michael Schock, and ultimately concludes that the change in water source increased the variability of pH and high chloride levels. *Id.* This, coupled with the lack of corrosion control, caused corrosive water to be delivered throughout the Flint distribution system due to alteration of the equilibrium necessary to maintain the passivation layer and scale material. *Id.*, PageID.77869. Dr. Weisel identified the presence of lead in the pipes, connectors, service lines, and interior

plumbing (piping, fittings, solder and fixtures) that "release[d] lead into the drinking water due to the corrosive nature of the water delivered to their homes." *Id*., PageID.77872.

To perform his analysis, Dr. Weisel reviewed the Virginia Tech study of Flint homes which was the most extensive study of water lead concentrations across 268 homes in Flint during, and after, the Class Period. *Id*., PageID.77879–881; ECF No. 1208-129. Of the 268 homes sampled, 85% had lead levels above the Minimum Reporting Level (MRL) of 1 part per billion (ppb) in the first draw sample, and all homes measured in Flint had at least one sample with detectable lead above the .1 ppb instrumentational detection limit. ECF No. 2455-3 (2022 Weisel Decl.), PageID.77880. Dr. Weisel opined that individuals who ingested unfiltered tap water from these homes would have had increased lead ingestion exposure. *Id.*, PageID.77881. Dr. Weisel further opined that, throughout Flint, facilities built prior to 1986 would similarly contain lead and "would have increased lead in their tap water because of the corrosivity of the water resulting from the change of water source on April 25, 2014." *Id.*, PageID.77863.

Defendants challenge the opinions in Dr. Weisel's declaration on nearly identical grounds as set forth in their prior Motion to Exclude the Testimony and Declaration of Dr. Clifford Weisel (ECF No. 1384).

a. Dr. Weisel is a qualified expert in exposure science.

Defendants argue that Dr. Weisel is not qualified to render opinions regarding exposure science, which Defendants mischaracterize in the opening sentence of their brief as "the study of the effects of toxic agents on living organisms." ECF No. 2455 (2023 Weisel Motion), PageID.77827. Defendants actually describe the field of toxicology, not exposure science. Distinguishable from toxicology, "[e]xposure science does not typically deal with the health consequences of those exposures." Joseph V. Rodricks, *Reference Guide on Exposure Science*, in Federal Judicial Center, Reference Manual on Scientific Evidence 503, 507 (3d ed. 2011). Instead—as Class Plaintiffs have previously explained, in response to the same mischaracterization by Defendants—exposure science involves identification of "the nature and extent of contact with environmental contaminants over space and time." ECF No. 1522-3 (2021 Weisel Rebuttal Decl.), PageID.58869; ECF No. 1522 (Class Pltf. Resp. to 2021 Weisel Motion), PageID.58831.

Dr. Weisel is fully qualified to employ the methodologies of an exposure scientist to provide an opinion on the effects of the failure to implement corrosion control and its consequences for the distribution of lead throughout Flint's water supply. The National Academy of Sciences defines exposure science as follows: [5]

[5] National Research Council. 2012. *Exposure Science in the 21st Century: A Vision and a Strategy*. Washington, DC: The National Academies Press.

> [T]he collection and analysis of quantitative and qualitative information needed to understand the nature of contact between receptors (such as people or ecosystems) and physical, chemical, or biologic stressors. Exposure science strives to create a narrative that captures the spatial and temporal dimensions of exposure events with respect to acute and long-term effects on human populations and ecosystems.

Exposure scientists study how people and communities come into contact with harmful chemicals through various environmental media (*e.g.*, air, water, and soil) and assess the amounts of those chemicals to which people have been exposed.[6] Both Drs. Weisel and Georgopoulos implemented exposure science methodologies in this case.

Dr. Weisel is fully qualified to do so. He is a (now retired) tenured Professor of Public Health at Rutgers, the State University of New Jersey, and Director of the

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https://doi.org/10.17226/13507. *See also*, Joseph V. Rodricks, *Reference Guide on Exposure Science*, in FEDERAL JUDICIAL CENTER, REFERENCE MANUAL ON SCIENTIFIC EVIDENCE 503, 507 (3d ed. 2011). "Exposure science is the study of how people can come into contact with (are exposed to) chemicals that may be present in various environmental media (air, water, food, soil, consumer products of all types) and of the amounts of those chemicals that enter the body as a result of these contacts."

[6] Exposure science has a long history and is a well-recognized discipline by the scientific and academic communities, the U.S. EPA, and other government agencies. *See* U.S. EPA, *Guidelines for Human Exposure Assessment*, EPA/100/B-19/001, at p. 4 (October 2019), https://www.epa.gov/sites/production/files/2020-01/documents/guidelines_for_human_exposure_assessment_final2019.pdf (describing the field of exposure science). *See also* National Research Council. 2012. *Exposure Science in the 21st Century: A Vision and a Strategy.* Washington, DC: The National Academies Press. https://doi.org/10.17226/13507.

Rutgers graduate program in exposure science.[7] He has served on multiple Scientific Advisory Panels related to exposure science for the U.S. EPA, the National Institute of Health, and the National Academy of Science, among other governmental entities.[8] He has published over 135 peer-reviewed publications, including publications involving examinations of environmental exposure to populations and exposure to lead through multiple media.[9] Dr. Weisel has published peer-reviewed academic papers on the physical burdens placed upon residents following ingestion of a contaminant in a community water supply, exposure of residents from ingestion of contaminants from residential tap water, exposure to contaminants from showering with residential tap water, and the effect of lead in dust on blood lead levels[10] among others.[11] ECF No. 1522-3 (2021 Weisel Rebuttal Decl.), PageID.58868–69.

Dr. Weisel's application of exposure methodologies in this case conforms to the practices of the field.[12] He reviewed the primary source of water lead levels in

[7] ECF No. 2455-3, PageID.77856.

[8] *Id.*, PageID.77859.

[9] *Id.*, PageID.77858.

[10] *Id.*, PageID.77887–77903 (*Curriculum Vitae*, Peer Reviewed Publications).

[11] He has also served as a Peer Reviewer for the EPA on its *Guidelines for Human Exposure Assessment*.

[12] Tellingly, Defendants have failed to critique Dr. Weisel's opinions alongside those of a competing expert in the field of exposure science—relying instead on a defense toxicologist, Dr. Finley, and a water treatment engineer, Dr. Gagnon.

Flint during the Class Periods (the Virginia Tech data (ECF No. 1208-129 (VATECH_00212274)) and the academic literature summarizing that data. He presents findings concerning the concentrations of lead, the 90th percentile water lead level, and maximum first draw level. ECF No. 2455-3 (2022 Weisel Decl.), PageID.77879–881. He explains the variability in data associated with the first draw, as well as 1-minute and 3-minute sampling events, and the implications these variations have related to service line composition. *Id.*

Dr. Weisel also notes that after the reintroduction of orthophosphate and the switch back to Detroit water, median water lead levels exhibited a three-fold decline from August 2015 to July 2016. ECF No. 2455-4, PageID.77926. And he opines that the range of water lead levels employed by Dr. Georgopoulos in his biokinetic modeling of blood lead levels in Flint "are reasonable and represent conditions that could occur within homes in Flint." Ex. 7 (2023 Weisel Rebuttal Excerpt), at 31. Dr. Weisel's expert analysis assists in explaining the contaminated water conditions, and Dr. Georgopoulos and Dr. Hu rely build off of this analysis to demonstrate that the water is capable of causing adverse health effects.

b. Dr. Weisel is qualified to opine on the failure to implement corrosion control after the switch to the Flint River and its effect on the disbursement of lead throughout the water system.

Defendants challenge Dr. Weisel's qualifications to provide an expert opinion concerning the release of lead into the public water supply and move to exclude his

opinions on that topic. ECF No. 2455 (2023 Weisel Motion), PageID.77833–37. Defendants primarily challenge Dr. Weisel's Opinion #2: that the failure to use appropriate corrosion control after the switch to Flint River water resulted in a "'disruption of the protective layer on the surface of pipes and plumbing fittings and fixtures' in homes and other buildings in Flint." *Id*., PageID.77834 (citing excerpt from ECF No. 2455-3 (2022 Weisel Decl.), PageID.77867). Defendants' challenge fails for at least four reasons.

First, the fundamental predicate of Dr. Weisel's Opinion #2 is ***agreed upon*** by VNA itself. In its Opposition to Class Certification, VNA states:

> [T]he principal cause of the problems with Flint water was that the City failed to address corrosion concerns associated with the switch to the Flint River. During the years of using Detroit water, the metal in service lines or interior pipes made of iron or lead had reacted with the chemicals in that water to form a protective scale on the inside of the pipes. Ex. 34, Duquette Report 8. The City did not assess how the scale would fare when exposed to water from the Flint River, which has a different chemistry than Detroit water. *Id*. at 8-9. When the City started using Flint River water, the outer layers of the scale started to break down, and pieces of the scale (which included particles of lead and iron) entered the water supply.

ECF No. 1369 (Class Cert. Opp. Br.), PageID.45355–56. Dr. Weisel agrees with VNA on this fundamental point. ECF No. 1522-3 (2021 Weisel Rebuttal Decl.), PageID.58872. And as set forth above, Dr. Weisel is well-qualified to form opinions about the consequence of these corrosion control failures upon the distribution of

lead throughout Flint's water supply, and into the homes, recreational facilities, workplaces, restaurants, and schools of Flint Class Members.

Second, Dr. Weisel's opinion that Flint's switch to river water and parallel failure to continue corrosion control resulted in corrosion of Flint's water distribution system is admissible under FRE 702 because it is based on his knowledge of fundamental principles of chemistry, his research and publications involving contaminated water systems, and his qualifications as an exposure scientist. He is thus not merely "parroting" other experts and is qualified in his experience and knowledge to offer such opinions.

Third, Dr. Weisel's opinions are admissible under FRE 703 because experts are entitled to base their opinions "on facts or data in the case that the expert has been made aware of or personally observed[,]" and, if "experts in the particular field would reasonably rely on those kinds of facts or data in forming an opinion on the subject, they need not be admissible for the opinion to be admitted." Fed. R. Evid. 703. Dr. Weisel's opinions are well-grounded in his interpretation of the scientific literature, his review of the Virginia Tech water sampling data taken from homes in Flint (ECF No.1208-129), and the deposition of Michael Schock (U.S. EPA water

treatment expert)[13]—all of which (along with Defendants themselves) confirm that Flint's failure to continue corrosion control after the switch to the Flint River caused corrosion of Flint's water distribution system, thereby resulting in citywide contamination of Flint's drinking water and exposure of Flint's residents to lead-contaminated water.

Fourth, the academic literature demonstrates a general scientific consensus that the City of Flint: (a) switched to water from the Flint River which was corrosive, (b) terminated corrosion control, (c) experienced corrosion of Flint's water distribution system, service lines, and residential pipes, (d) experienced elevated water lead levels (WLLs) in the drinking water throughout the city and, as a result,

[13] Dr. Weisel reviewed the deposition testimony of Michael Schock, an EPA water treatment and corrosion expert, who issued a report based on water sampling he conducted in Flint. Schock testified that:

- Flint was experiencing "high lead results," (Ex. 8 (Schock Dep.) at 49:11–14);
- According to an interim report in 2015, Flint had no "corrosion control treatment," (*id.* at 73:4–21);
- Flint city personnel on the technical advisory committee did not have a "sophisticated understanding of the nuances of a corrosion control treatment," (*id.* at 95:14–17);
- "[T]he condition they had really needed to be changed rapidly, that it was a corrosive water," (*id.* at 125:16–20); and
- There was a "widespread corrosion problem," indicating a "pretty big lead problem," (*id.* at 324:18–24).

exposed its residents to lead-contaminated water.[14] Defendants' unretained expert Dr. Marc Edwards also concluded that "[t]he Flint River was a more corrosive and unstable water source, which did not have either optimized corrosion control or added orthophosphate corrosion inhibitors[,]" and that "***there was a system-wide lead in water contamination problem***[,]" and "***[t]he incidence of elevated WLLs [water lead levels] was evident throughout the city***."[15] (Emphasis added).

Dr. Weisel's opinions are well-grounded and supported by the discovery record in this case, his analysis of the water sampling data performed by Virginia Tech and others, the academic literature, the opinions of other experts, and even Defendant VNA's own position as presented in its class certification briefing. His opinions are appropriately reliable, and admissible, under Federal Rules of Evidence 702 and 703.

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[14] *See e.g.*, Susan J. Masten et al., *Flint Water Crisis: What Happened and Why?*, 108 J. Am. Water Works Ass'n 22, 22, 33 (2016) (concluding that "elevated levels of lead found in the drinking water of residences in Flint have had a profound effect . . ." and Flint's "failure to recognize the corrosivity of the water and to add a corrosion inhibitor had devastating effects."). *See also*, Kelsey J. Pieper et al., *Evaluating Water Lead Levels During the Flint Water Crisis*, 52 Env't Sci. Tech. 8124, 8124-8125 (2018).

[15] Kelsey J. Pieper et al., *Evaluating Water Lead Levels During the Flint Water Crisis*, 52 Env't Sci. Tech. 8124, 8125–8126 (2018). *See also* Siddhartha Roy et al., *Lead release to potable water during the Flint, MI water crisis as revealed by routine biosolids monitoring data*, 160 Water Rsch. 475, 475, 478 (2019) ("our Virginia Tech research team exposed citywide water lead contamination…" and their sampling "reflects citywide release of lead to water from plumbing.").

c. Dr. Weisel's opinions with respect to the prevalence of lead-contaminated water in homes before 1986 are admissible.

Defendants also challenge Dr. Weisel's opinion that homes constructed prior to 1986 were more likely than not to contain lead in plumbing that would serve as a source for increased lead exposure to class members. ECF No. 2455 (2023 Weisel Motion), PageID.77837–844). Dr. Weisel's Opinion #3 asserts that "homes, recreational facilities, workplaces, restaurants, and schools that had lead service lines, galvanized steel service lines with connectors containing lead, or interior plumbing that had lead solder or other lead containing fittings and fixtures (*i.e.* structures built prior to 1986 that did not have complete plumbing upgrades) would have increased lead in their tap water because of the corrosivity of the water resulting from the change of water source on April 25, 2014."[16]

First, there is unrefuted evidence from public governmental records that more than 99% of Flint's homes were built before 1986 and therefore have interior plumbing with lead components, including lead solder (e.g., copper or other interior piping joined with lead solder) or fixtures (e.g., faucets) containing lead.[17]

[16] ECF No. 2455-3 (2022 Weisel Decl.), PageID.77863. Dr. Weisel never testified nor opined in his report that "all homes" in Flint built before 1986 would have lead-containing fixtures and fittings, as Defendants posit. ECF No. 2455 (2023 Weisel Motion), PageID.77839.

[17] The publicly available data from the City of Flint GIS (Geographic Information Systems) Department and the University of Michigan Geographic Information Systems Center shows that, of 39,410 residences, 39,126 (99.28%) were built before

Defendants' claim that Class Plaintiffs cited no evidence or studies supporting this fact is simply false. To the contrary, Dr. Russell also set forth the factual basis supporting this well-known fact: [18]

> 1986 was a critical date as it relates to lead in plumbing systems. In 1986, the Safe Drinking Water Act was amended to prohibit the use of leaded solder (effective June 1988). Based on the age of the residences in Flint, effectively all structures that contain copper plumbing systems likely contain leaded solder.[19]

1986, with 23,272 (59.05%) built before 1950. *See* University of Michigan Geographic Information Systems Center, *available at:* https://www.umflint.edu/gis/gis-projects (last visited Mar. 23, 2021).

[18] It is common knowledge that homes built prior to 1986, as a rule, contained high-lead components. *See* U.S. EPA. *Air Quality Criteria For Lead (Final Report, 2006)*, EPA/600/R-05/144aF, at p. 3-35 (2006) ("The primary type of solder used in the United States was 50-50 tin-Pb solder (50% tin, 50% Pb) before the Safe Drinking Water Act amendments of 1986 were enacted."); *Helpful Definitions for Community Water Systems*, Arkansas Dep't of Health, https://www.healthy.arkansas.gov/programs-services/topics/drinking-water-lead-and-copper-helpful-definitions ("Until the lead ban took effect (approx. 1986) most solder contained about 50 percent lead."); Bob Henson, *When Lead Went Dead*, Harris Products Group, https://www.harrisproductsgroup.com/en/blog/2015/november/when-lead-went-dead.aspx ("By far the most common-lead-bearing plumbing solder was 50/50 (nominally 50% tin and 50% lead)."); *Lead and Faucets – Questions and Answers*, Massachusetts Water Rsch. Auth., (May 20, 2020), https://www.mwra.com/04water/html/Lead_Faucets.htm ("Most faucets purchased prior to 1997 were constructed of brass or chrome-plated brass, which contain up to 8 percent lead[.]").

[19] ECF No. 1208-67 (2020 Russell Decl.), PageID.35432.

Dr. Edwards, Defendants' "non-retained" expert, similarly confirmed this fact, stating, "[r]oughly 95% of Flint homes were built in the pre-1986 time period when high lead content solder and brass was commonplace."[20]

As Dr. Weisel explains:[21]

> Homes that have a source of lead content in their interior plumbing, which is common to homes constructed prior to 1986, will leach lead when improperly treated corrosive water is present. This can be a significant source of lead exposure. Dr. Larry Russell reported that "lead-soldered copper pipes gave off 19 times the amount of lead with the Flint River water over DWSD water."

ECF No. 1208-67, PageID.35475. Dr. Weisel also relied upon the testing performed by Virginia Tech in August/September 2015, which confirmed that ***every*** sampled home within the City of Flint had detectible levels of lead in the water.[22]

As evidenced by the Virginia Tech water samples, ***even the houses that were not served by lead service lines contained lead in their water.*** As Dr. Weisel reports:

> Even where a house does not have lead or galvanized service lines, interior plumbing can be a significant source of lead. Marc Edwards reported, for example, that class representative Elnora Carthan's home (which he reports as resident X) did not have lead or galvanized service lines. Nonetheless, ***Ms. Carthan's home had the highest level of lead, 1051 µg/L, of any home***

[20] Siddartha Roy et al., *Efficacy of corrosion control and pipe replacement in reducing citywide lead exposure during the Flint, MI water system recovery*, 6 Env't Sci. Water Rsch. Tech. 3024, 3027 (2020).

[21] ECF No. 1522-3 (2021 Weisel Rebuttal Decl.), PageID.58873.

[22] *See* ECF No. 1208-129 (VATECH_00212274), 2015 tab.

> ***tested*** in Virginia Tech's sampling of Flint homes in August 2015.

ECF No. 1522-3 (2021 Weisel Rebuttal Decl.), PageID.58873–74 (emphasis added).[23]

Defendants quibble with Dr. Weisel's conclusions by pointing to the fact that one home, Class Representative Rhonda Kelso's pre-1986 constructed home, was replumbed in the year 2000 in a feeble attempt to undermine the reliability of Dr. Weisel's opinion that pre-1986 homes would contain lead in their water. ECF No. 2455 (2023 Weisel Motion), PageID.77838 fn.3. This argument fails, as "Ms. Kelso's elevated lead levels were confirmed in the August 2015 Virginia Tech Sampling, which detected 66.2 parts per billion of lead at her home."[24] ECF No. 1522-3 (2021 Weisel Rebuttal Decl.), PageID.58875. Defendants simply omit from their argument the fact that Ms. Kelso's home had elevated water lead levels.

Finally, VNA argues that their expert "Dr. Finley's review of the data revealed that the majority of samples collected from homes with copper rather than lead service lines in August 2015 had non-detectable water lead levels." ECF No. 2455

[23] Relying on Siddartha Roy et al., *Efficacy of corrosion control and pipe replacement in reducing citywide lead exposure during the Flint, MI water system recovery*, 6 Env't Sci. Water Rsch. Tech. 3024, 3027 (2020); *See also* ECF No. 1208-129 (VATECH_00212274).

[24] *See also*, ECF No. 1208-129 (VATECH_00212274), 2015 tab.

(2023 Weisel Motion), PageID.77842. Such disputes between experts are not grounds for exclusion. *See supra*, § II(D).

Furthermore, Dr. Finley is mistaken. Dr. Finley misunderstood the instrumentational detection limit of Virginia Tech's Flint Water Study, which used inductively coupled plasma mass spectrometry. Ex. 9 (M. Edwards Dep.) at 637:5–638:4. The detection limit for that instrument is .1 ppb or less, per Dr. Edwards. *Id.* As demonstrated by a review of the raw data itself,[25] the water sampling data collected by the Virginia Tech sampling team in August/September 2015 showed that "[a]ll homes measured during the 2015 sampling period in Flint had at least one sample with detectable lead above the 0.1 µg/L the instrumentational detection limit…" ECF No. 2455-3 (2022 Weisel Decl.), PageID.77880. It follows that Dr. Finley's claim that "the majority of samples collected from homes with copper rather than lead service lines in August 2015 had non-detectable water lead levels[,]" is incorrect. ECF No. 2455 (2023 Weisel Motion), PageID.77842.

Ultimately, it is up to the jury, not VNA or its experts, to weigh the value of Dr. Weisel's opinions regarding homes constructed prior to 1986. *See Phillips*, 400 F.3d at 399 (battles of the experts are for the jury to decide); *supra* §§ II(D)-(E). Defendants' motion provides no basis for excluding Dr. Weisel's testimony.

[25] *See* ECF No. 1208-129 (VATECH_00212274), *2015 tab*.

d. Defendants' challenge with respect to Dr. Weisel's opinions under FRE 403 are meritless.

As noted above, Federal Rule of Evidence 403 provides "a balancing test for excluding relevant evidence[,]" which is "strongly weighted toward admission." *United States v. Asher*, 910 F.3d 854, 860 (6th Cir. 2018). Exclusion is appropriate only when the "probative value is substantially outweighed by the danger of unfair prejudice." *Id*. (citing *Huddleston v. United States*, 485 U.S. 681, 687 (1988)). Where expert testimony presents a risk that a jury will misunderstand it, "a district court…could require advocates to describe it in a way that will not generate unfair prejudice or mislead the jury." *United States v. Gissantaner*, 990 F.3d 457, 470 (6th Cir. 2021) (citing Fed. R. Evid. 403) (cleaned up).

Whether and to what degree Class Plaintiffs were exposed to increased concentrations of lead is one of the central questions of this case. Dr. Weisel's opinions go directly to that question and are therefore highly probative.

Defendants' purported concern is that the jury will misunderstand Dr. Weisel's testimony and will "improperly infer from it that class members were exposed to harmful lead levels even though Dr. Weisel does not offer that opinion." ECF No. 2455 (2023 Weisel Motion), PageID.77846. Dr. Weisel does not, as Defendants posit, need to "opine that Flint water was capable of causing any of the thirteen specific harms claimed by Plaintiffs." *Id.*, PageID.77844. Dr. Weisel is not a toxicologist, and he is not proffered to provide opinions regarding whether any

particular levels of lead are harmful or what types of adverse health effects lead is capable of causing. Dr. Weisel's analysis of the increased water lead levels forms an important component of the exposure assessment upon which Dr. Hu's subsequent analysis of whether Flint Water is capable of causing adverse health effects is predicated.

In short, Dr. Weisel's findings that Flint's WLLs remained elevated through (and, as evidence supports, beyond) the Class Period are well-grounded and supported by the record, including through his review of the underlying water monitoring data, the discovery record, and the academic work of Defendants' experts Roy and Edwards.

Defendants' motion should be denied.

4. Dr. Panagiotis ("Panos") Georgopoulos

Dr. Georgopoulos is a tenured professor and research scientist, with expertise in exposure science, biological dosimetry, and pharmacokinetic/toxicokinetic modeling at Rutgers University's Biomedical and Health Sciences, Department of Environmental and Occupational Health and Justice, Rutgers School of Public Health. ECF No. 2483-3 (2022 Georgopoulos Decl.), PageID.82250. He directs the Computational Chemodynamics Laboratory at Rutgers and has sat on numerous scientific committees and panels, including the External Peer Review Committee for the USEPA Technical Approach for Lead (2014-2015), the CDC/ATSDR Peer

Review Panel for Modeling Guidance on Indoor Water (2017-2018) and the USEPA Peer Review Panel for Lead in Drinking Water (2017-2018).

Dr. Georgopoulos builds off of the work done by Dr. Weisel and opines on the impact that ingesting lead-contaminated water at the ranges documented by Virginia Tech in Flint would have on people's blood lead levels. Specifically, Dr. Georgopoulos utilized a U.S. EPA model integrating the exposure, uptake, and biological kinetics of lead to calculate estimates of blood lead levels for persons exposed to increased water lead levels in Flint during the Class Period.[26] ECF No. 2483-3 (2022 Georgopoulos Decl.), PageID.82249–250. The All-Ages Lead Model ("AALM") accounts for biokinetic processes of lead in the human respiratory tract, gastrointestinal tract, vasculature, and skeleton. *Id.*, PageID.82261, Fig.1. It was promulgated by the EPA, *id*., PageID.82257, and has been scientifically evaluated using three studies which concluded that the model can provide an accurate prediction of dose-blood lead relationships when actual doses are known. *Id.*, PageID.82267.

Dr. Georgopoulos applied the AALM model to predict how varying levels of lead in water ingested by Class Members in Flint would cause associated levels of lead in their blood. In Table 1 of his report, he presents the modeled predictions for

[26] In an earlier report, Dr. Georgopoulos performed similar biokinetic modeling to estimate the range of blood lead levels in children using the IEUBK model. *See* ECF No. 1208-137 (Georgopoulos Class Cert Rpt.), PageID.37961.

water lead levels and the corresponding blood lead levels that ingestion of such water would generate for male and female subjects ranging in age from 10 to 65. ECF No. 2483-3 2022 (Georgopoulos Decl.), PageID.82269. Table 1 presents a range of water lead levels, from 2 µg/L (at the low end) to 300 µg/L (at the high end) and the corresponding predictions of the levels of lead in blood that are attributable to water ingestion at each water lead level. *Id.*

With respect to selecting the AALM model to perform this work, Dr. Georgopoulos cites a 2019 U.S. EPA report which concluded that "the model reliably predicts both quasi-steady state blood Pb concentrations as well the rates of change Pb that occur with a change in exposure…" *Id.*, PageID.82268.[27] The AALM model "has been extensively evaluated with positive results." Ex. 10 (2023 Georgopoulos Dep.) at 145:23–146:2. When it comes to evaluating risk attributable to incremental increases in water lead levels for adults, the EPA recognizes the AALM as the best model for that purpose. *Id*. Dr. Georgopoulos thus used a methodology promulgated by the EPA to demonstrate how different concentrations of lead ingested in water will "reliably predict" (to use EPA's words) the corresponding levels of lead in blood.

[27] Citing U.S. EPA, *Technical Support Document for the All Ages Lead Model (AALM) – Parameters, Equations, and Evaluations*, EPA/600/R-19/011, at p. 64:5-6 (May 2019).

The FRE 702 inquiry is focused "solely on principles and methodology, not on the conclusions they generate." *Daubert*, 509 U.S. 579, 594-95. Defendants do not question Dr. Georgopoulos' expertise in exposure science or biokinetic modeling, nor do they question his selection of the AALM model as the underlying methodology to calculate his predictions of estimated blood lead levels—nor could they. Rather, Defendants challenge only [the variables selected to run the model, and therefore its outcome and reliability. As explained further below, none of this warrants exclusion.

a. Defendants' critique of Dr. Georgopoulos' selection of inputs for his AALM model simulations is misleading and within the province of the jury.

The performance of modeling simulations by Dr. Georgopoulos requires the selection of various environmental media parameters to serve as the inputs for the AALM exposure model. This model calculates rates of lead intake "based on inputs for exposure to Pb in air, food, indoor dust, soil, water, and from miscellaneous ingestion intakes, such as pica (designated in the model as 'other')." ECF No. 2483-3 (2022 Georgopoulos Decl.), PageID.82259. In selecting his modeling inputs, Dr. Georgopoulos explained that "assumptions are made regarding the levels of lead in air, soil, dust, and diet so that the levels are generally consistent with what has been observed in the scientific literature for Flint or urban environments like Flint…" *Id.*, PageID.82258. Georgopoulos cites multiple academic papers documenting levels of

air, soil, dust and diet to provide well-grounded support for the input parameters he selected to simulate lead exposure in Flint. *Id.*[28]

Defendants nevertheless cite to their toxicologist, Dr. Finley, to critique Dr. Georgopoulos' selection of input parameters. Yet again, Defendants have pitted one expert against another in a battle that must play out in front of the jury.

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[28] Citing Pierre Goovaerts, *The Drinking Water Contamination Crisis in Flint: Modeling Temporal Trends of Lead Level Since Returning to Detroit Water System*, 581 Sci. Total Env't, at 66 (2017); Pierre Goovaerts, *Geostatistical prediction of water lead levels in Flint, Michigan: A multivariate approach.* 647 Sci. Total Env't, at 1294 (2019); Michigan Dep't Env't Quality, *Flint Community Schools Testing Results – Initial Screen*, State of Michigan (Oct. 2, 2015), https://www.michigan.gov/documents/deq/Flint_Community_Schools_Testing_Results__Initial_Screen_502382_7.pdf; Michigan Dep't Env't Quality, *Schools Testing Results*, State of Michigan (2016("a")), https://www.michigan.gov/flintwater/0,6092,7-345-76292_76294_76297_77897-455439--,00.html; Michigan Dep't Env't Quality, *Child/Day Care Testing Results*, State of Michigan (2016("b")), https://www.michigan.gov/flintwater/0,6092,7-345-76292_76294_76297_77898_77908---,00.html; Mona Hanna-Attisha et al., *Elevated Blood Lead Levels in Children Associated With the Flint Drinking Water Crisis: A Spatial Analysis of Risk and Public Health Response*, 106 Am. J. Pub. Health, at 283 (2016); Mona Hanna-Attisha et al., *Umbilical Cord Blood Lead Level Disparities between Flint and Detroit*, 38 Am. J. Perinatology e26, e26–e32 (2021); Chinaro Kennedy et al., *Blood Lead Levels Among Children Aged <6 Years — Flint, Michigan, 2013–2016*, 65 Morbidity Mortality Wkly. Rpt., at 650 (2016); Mark A.S. Laidlaw et al., *Children's Blood Lead Seasonality in Flint, Michigan (USA), and Soil-Sourced Lead Hazard Risks*, 13 Int. J. Env't Rsch. Pub. Health, at 358 (2016); Kelsey J. Pieper et al., *Evaluating Water Lead Levels During the Flint Water Crisis*, 52 Env't Sci. Tech., at 8124 (2018); Sammy Zahran et al., *Four phases of the Flint Water Crisis: Evidence from blood lead levels in children*, 157 Env't Rsch., at 160 (2017); Sammy Zahran et al., *Water lead exposure risk in Flint, Michigan after switchback in water source: Implications for lead service line replacement policy*, 181 Env't Rsch., at 108928 (2020).

Caselaw is clear that a mere disagreement between experts over the selection of data inputs is not an appropriate basis to exclude such testimony. Instead, such critiques go to its weight, not its admissibility. *In re Scrap Metal*, 527 F.3d at 530; *supra*, § II(D). "[T]he selection of data inputs to employ in a model is a question separate from the reliability of the methodology reflected in the model itself." *Manpower, Inc. v. Ins. Co. of Pennsylvania*, 732 F.3d 796, 807 (7th Cir. 2013) (vacating exclusion of expert testimony based upon disputed model inputs); *Stollings v. Ryobi Techs., Inc.*, 725 F.3d 753, 767 (7th Cir. 2013) (reversing because the court should have let the jury decide how uncertainty as to the data relied upon by the expert affected that expert's opinion); *Lawes v. CSA Architects & Eng'rs LLP,* 963 F.3d 72, 90 (1st Cir. 2020) (vacating expert's exclusion under FRE 702 and holding that "district courts must not 'unduly scrutinize[]the quality of the expert's data[.]'").

Admissibility of biokinetic modeling to predict lead levels has been judicially recognized. In *Burton v. American Cyanamid*, 362 F. Supp. 3d 588 (E.D. Wis. 2019), the court rejected a party's challenge to the use of an IEUBK model to evaluate multiple pathways of exposure to lead in children, and specifically—as here—a challenge to the data used as inputs to a biokinetic model. The court held:

> [P]laintiffs challenge the validity of the data to which [the expert] applied the model—for example, his reliance on studies of lead concentration in various sources in properties close to plaintiffs' homes, and his assumptions regarding the amount of dust and water plaintiffs

> consumed as children. These challenges to his underlying data and assumptions go to the weight of his testimony and are for the jury.

Id. at 609. Here, too, challenges to Dr. Georgopoulos' inputs go to the weight, not the admissibility, of his opinions.

For example, in response to Dr. Georgopoulos' initial report, defense expert Dr. Finley (who possesses no credentials in biokinetic modeling[29]) criticized Dr. Georgopoulos for using an 80 ppm input parameter for indoor dust instead of the 752 ppm indoor dust measurement which Finley identified as the level at one of the homes of a class representative. To address this criticism, Dr. Georgopoulos reran his predicted blood lead levels with the Defendants' suggestion that an indoor dust level of 752 ppm be used instead of the 80 ppm. Those results are reported in Table 1 of Dr. Georgopoulos' rebuttal report. ECF No. 2483-5 (2023 Georgopoulos Rebuttal Decl.), PageID.82456, Table 1. As expected, the blood lead levels are higher, and "the AALM model continues to predict that incremental increases of lead exposure in water will yield increases in an adult's levels of lead in blood." *Id*., PageID.82456.

[29] Dr. Georgopoulos notes in his rebuttal report that Dr. Finley's discussion of the AALM modeling provides information that can be misinterpreted by someone not familiar with standard U.S. EPA procedures. ECF No. 2483-5 (2023 Georgopoulos Rebuttal Decl.), PageID.82458. Dr. Finley's own misunderstanding illustrates the point.

The same relationship is true for the other input parameters criticized by Defendants. As Dr. Georgopoulos opined in both his deposition and his declaration:

> It is, of course, the case that variations in the parameters for these other pathways will lead to differences in my modeled point estimates for the effects that elevated Water Lead Levels will have in increasing Blood Lead Levels. ***But variability in these other parameters will not change the fundamental conclusion that exposure to increased levels of lead through water ingestion will lead to increased levels of lead in blood.*** As I testified in my deposition, this is true irrespective of whether the level of lead that an individual is exposed to from other pathways, such as air, dust, or food, are high or low. (Georgopoulos 11.23.22 Dep., pp. 217–19).

ECF No. 2483-5 (2023 Georgopoulos Rebuttal Decl.), PageID.82455 (emphasis added).

Despite all of this, Defendants specifically criticize three variables. While the Court can and should dismiss Defendants' challenge to data inputs out of hand, a closer look confirms that each of the variables at issue meets FRE 702's threshold of admissibility.

First, Defendants criticize Dr. Georgopoulos for modeling levels of increased water lead up to 300 µg/L or parts per billion (ppb). They argue that "that range is not representative of actual water lead levels in Flint." ECF No. 2483, PageID.82226.

Wrong.[30] Dr. Georgopoulos ***did*** use ***actual*** water lead levels from the community. The water lead levels he used for modeling the impact of Flint water ingestion on blood lead levels were "within the range of lead levels ***found in water samples taken from Flint homes*** in August and September of 2015." ECF No. 2483-5 (2023 Georgopoulos Rebuttal Decl.), PageID.82460 (emphasis added). *See also,* ECF No. 1208-129 (VATECH_00212274). Indeed, the water lead level of 300 ppb[31] selected as the upper bound of Dr. Georgopoulos' analysis was significantly below the highest measurement of 13,200 ppb measured in Flint making it a "reasonable, ***and conservative***, selection of an 'upper tail' measurement." ECF No. 2483-5 (2023 Georgopoulos Rebuttal Decl.), PageID.82461 (emphasis added). Dr. Weisel similarly found the selection of water lead levels employed by Dr. Georgopoulos reasonable in comparison to the actual water levels of lead measured by Virginia

[30] VNA's argument that the use of water lead levels of between 1 to 300 parts per billion as the water lead levels to evaluate is "hypothetical" or "not representative" is contradicted by their own expert. Dr. Finley stated in his earlier expert report: "Sampling from the 2015 Flint Water Study found WLLs ranging from non-detect (ND) to 500 ppb across the City of Flint (Figure 13)." ECF. No. 1370-18 (2021 Finley Decl.), PageID.46462.

[31] Although the range of exposure levels for lead in water were based upon the range of ***actual*** levels of lead in water as measured by Virginia Tech in the Fall of 2015, even if the measures had been purely hypothetical, Dr. Georgopoulos' opinions would still have probative value. "[M]any experts render opinion based solely upon hypotheticals presented by counsel, a practice recognized under the rule." *Dow Corning Corp. v. Weather Shield Mfg., Inc.*, 2011 WL 2490962, at *9 (E.D. Mich. June 22, 2011) (citing F.R.E. 703 Advisory Comm. Notes).

Tech in Flint and that they "represent conditions that could occur within homes in Flint." ECF No. 2455-4 (2023 Weisel Rebuttal Decl.), PageID.77950.

Second, Defendants attack Dr. Georgopoulos' modeling assumption that Class Members would ingest water with constant levels of lead over a period of ninety days. ECF No. 2483 (2023 Georgopoulos Motion), PageID.82228–230. Defendants argue, without citation to expert reports, that failure to account for this variability means "his model would be incapable of accurately predicting that person's blood levels." *Id*., PageID.82228–29. Of course, as Dr. Georgopoulos notes, "individuals who were exposed for shorter or longer periods of time…will have correspondingly lower or higher increases in Blood Lead Levels." ECF No. 2483-5 (2023 Georgopoulos Rebuttal Decl.), PageID.82462.[32] Similarly, Dr. Georgopoulos testified that he could rerun the model with only intermittent once-a-week use of unfiltered Flint water and the model would still predict that "blood lead levels are going to go higher." Ex. 10 (2023 Georgopoulos Dep.) at 143:20.

Moreover, the model will accommodate simulations where a subject is exposed to varying degrees of exposure in water from different sources at different locations throughout the day and take "the weighted average of contributions from

[32] Defendants similarly argue that some individuals within Flint switched off of Flint Water and used bottled water instead. Or that they used filtered tap water. ECF No. 2483 (2023 Georgopoulos Mot.), PageID.82229–230.

all exposures that contribute to that particular exposure medium." ECF No. 2483-3 (2022 Georgopoulos Decl.), PageID.82260.

Finally, Defendants challenge Dr. Georgopoulos' baseline lead level exposure assumptions. ECF No. 2483 (2023 Georgopoulos Mot.), PageID.82230–33. As to baseline water lead levels, both in his report and at his deposition, Dr. Georgopoulos defers to Dr. Weisel on the issue of selection of baseline water lead levels. ECF No. 2483-5 (2023 Georgopoulos Rebuttal Decl.), PageID.82459. As explained in Dr. Weisel's Rebuttal Declaration, the primary purported "evidence" that Defendants rely upon for asserting that pre-Flint Water Crisis water lead levels were higher than the baseline assumptions presented in Dr. Georgopoulos' modeling work was the ***hypothesized*** biosolids-derived water lead level predictions generated by Roy and Edwards. *Id*., PageID.82459–460.[33] Defendants' purported "evidence" suffers from significant methodological deficiencies of its own. *See id*., PageID.82461–479; Ex. 11 (2023 Russell Rebuttal Decl.), p.58 §7.6. The decision of Drs. Weisel and Georgopoulos not to rely upon the Roy and Edwards hypothesized biosolids-derived water lead levels was methodologically sound and, at best, will form the basis upon which a jury may evaluate the credibility of competing experts.

Moreover, even if one accepts Defendants' premise that pre-Flint Water crisis water lead levels were higher than those assumed in Dr. Georgopoulos' modeling

[33] Defendants cite to this purported evidence at: ECF No. 2483, PageID.82232 n.3.

work, "the calculated increased BLL for increased WLL present in the post-changeover Flint water would still be additive to a higher baseline BLL." ECF No. 2455-4 (2023 Weisel Rebuttal Decl.), PageID.77929. *See also* ECF No. 1520-3 (2021 Hu Rebuttal Decl.), PageID.58740–41. Like the Defendants' other arguments, these are issues more appropriately evaluated by a jury than determined on a *Daubert* motion.

Finally, Defendants argue that older adults had higher levels of lead in their blood in their youth, rendering application of the model to such adults unreliable. ECF No. 2483 (2023 Georgopoulos Mot.), PageID.82233. Yet the EPA has specifically evaluated applicability of the model to adults and found that it "reliably predicts" their blood lead concentrations. ECF No. 2483-3 (2022 Georgopoulos Decl.), PageID.82268. Like the other arguments presented by Defendants, this critique is not a sufficient basis to exclude Dr. Georgopoulos' testimony.

b. Defendants' critiques of Dr. Georgopoulos improperly conflate general and specific causation.

Defendants' motion attempts to conflate the ***general causation question*** of whether contaminated water in Flint was capable of causing harm (adverse health effects from contaminated water ingestion) with the ***specific causation question*** of whether the water conditions harmed a specific class representative. *See generally Lowery v. Enbridge Energy Ltd. P'ship*, 500 Mich. 1034, 898 N.W.2d 906, 914

(2017) (Markman, Concurring) (explaining differences between general and specific causation). Examples of their arguments include:

- "But Dr. Georgopoulos did not model blood lead levels of ***any specific individual,*** even though the model can be used that way." (2023 Georgopoulos Motion, ECF No. 2483, PageID.82218) (emphasis added);
- "For example, he did not consider exposure information specific to the class representatives." (*Id*.);
- "Dr. Georgopoulos did not consider soil lead data for the class representatives, which were as high as 4,600 ppm." (*Id*., PageID.82222–23).

Defendants ignore that Dr. Georgopoulos is not required to evaluate the exposure of any specific individual in order to address general causation issues. Dr. Georgopoulos used water lead levels taken from Flint, and other input parameters taken from Flint or urban communities like Flint, for his AALM simulations. ECF No. 2483-3 (2022 Georgopoulos Decl.), PageID.82258. As Defendants concede in their motion, this will produce "an average central tendency estimate" for exposure in the population for those individuals who ingested Flint water. ECF No. 2483 (2023 Georgopoulos Motion), PageID.82221. Dr. Georgopoulos explained that "the average sample population may not match exactly any one individual in the population…" Ex. 10 (2023 Georgopoulos Dep.) at 64:8–10. But for purposes of addressing general causation questions, this is an appropriate approach.

Defendants nevertheless rely upon *Palmer v. Asarco Inc.*, No. 03-CV-0498, 2007 WL 2298422, at *9 (N.D. Okla. Aug. 6, 2007), an unreported decision from the Northern District of Oklahoma, to support exclusion of the use of a biokinetic model. Yet, in *Palmer*, the challenged expert was addressing the ***specific causation*** question of seven children who were exposed to lead, not the general causation questions addressed by Dr. Georgopoulos here.[34]

If there was any question as to whether Dr. Georgopoulos was required to evaluate the exposure profile of a specific individual in Flint—as opposed to exposure characteristics in Flint generally—it has already been addressed by both this Court and the Sixth Circuit. In a colloquy with the Court and Veolia's counsel at the September 14, 2022 status conference, counsel for Veolia inquired about Certified Issue #6 (now Issue #3) and "what exactly is the line for the class case regarding I guess I would say specific causation type issues or individual issues or

[34] The *Palmer* decision is also distinguishable in two additional respects. First, in *Palmer*, the challenged expert "acknowledged that he did not know how to run the EPA's Integrated Exposure Uptake Biokinetic Model ('IEUBK')…" 2007 WL 2298422, at *9 (N.D. Okla. Aug. 6, 2007). Dr. Georgopoulos clearly knows how to run the AALM model. Second, in *Palmer*, there was no need to model predicted blood lead levels of the children because the Plaintiffs were already in possession of actual blood tests. ("[T]here was no reason for [the expert] to estimate blood lead levels when actual testing existed.") *Id.* at *10. Here, the specific blood lead levels of the vast majority of the Class Members, both before the crisis and during the crisis, are not known.

just in general." ECF No. 2220 (Sept. 14, 2022 Status Conf. Tr.), Page ID.73734 (lines 14 to 16).

The Court instructed as follows:

> [THE COURT:] So I don't want to see the parties spending their time on individualized causation and individualized damages when the issue here in number 6 is were the corrosive water conditions allegedly caused by defendants capable of causing harm to Flint residents, property, and businesses. I don't think you need to talk to the named plaintiffs and get their medical records to see if it happened to them. Because the question is just whether it's capable of causing harm.
>
> Does that help, Mr. Campbell?

Id., PageID.73736 (lines 10 to 18).

The Sixth Circuit has provided similar instruction when it rejected Defendants' Rule 23(f) petition. That Court determined that each of the certified issues is "capable of resolution with generalized, class-wide proof." ECF No. 2097 (Jan. 24, 2022 Order from U.S. Ct. App. 6th Cir.), PageID.71984 (citing *Martin v. Behr*, 896 F. 3d 405 at 414.) It specifically held that whether the water conditions in Flint were capable of causing harm is a question "that will be answered the same for every plaintiff." ECF No. 2097, PageID.71985. This trial, then, will address the general question of whether the Flint water during the Class Period was capable of causing harm. As the Sixth Circuit explained, "[o]nly after those issues are resolved do individualized inquiries into a given plaintiff's circumstances become necessary." *Id*.

Dr. Georgopoulos' approach of using general lead exposure variables drawn from the Flint community, or from more general academic literature regarding urban communities like Flint, is a reliable method to address the question of whether Flint water was capable of causing harm.

c. Defendants mischaracterize Dr. Georgopoulos' reliance upon adult population exposure studies in Flint.

Dr. Georgopoulos cites numerous studies to explain that the inputs he included in his AALM model for lead in air, soil, dust, and diet "are generally consistent with what has been observed in the scientific literature for Flint or urban environments like Flint…" ECF No. 2483-3 (2022 Georgopoulos Decl.), PageID.82258. His declaration makes clear that this is the purpose for which he relied upon the studies—to demonstrate that the selection of his inputs was appropriate. Defendants' motion nevertheless mischaracterizes the purpose for which he cited and relied upon the studies. *See* ECF No. 2483 (2023 Georgopoulos Motion), PageID.82233–36. Their red herring argument does not support excluding his proffered expert opinions.

Dr. Georgopoulos explained in deposition that use of population-wide data studies for blood lead levels in adults has several limitations, including (but not limited to) the following:

1. Unlike children, the number of adults with measured blood levels during the class period was extremely small. As a result population level trends in adults, in either direction, are not as

likely to be demonstrated with statistical significance (*see*, *e.g.*, Ex. 10 (2023 Georgopoulos Dep.) at 130:3–33:13). The MDHHS study of Flint residents, for example, found that adult blood levels increased during the Class Period. But the sample size was too small to demonstrate statistical significance. (ECF No. 2483-3 (2022 Georgopoulos Decl.), PageID.82233);

2. Many population level studies evaluate lead levels based upon the zip code in which the subjects of the study live. In Flint, reliance on zip code level data conflates people who live outside of Flint but share a zip code with residents within the City of Flint. This will have the effect of diluting, or understating, the blood lead levels of the portion of the population that actually lived in Flint and ingested Flint water.[35] (Ex. 10 (2023 Georgopoulos Dep.) at 138:16–140:22);

3. Over the class period, an increasing number of people residing in Flint avoided ingesting Flint water altogether. Inclusion of the blood lead levels of those individuals in population-wide blood lead level averages will understate the blood lead levels of that portion of the population that continued to ingest Flint water. (*Id.* at 141:3–15; *see also* ECF No. 2483-5 (2023 Georgopoulos Rebuttal Decl.), PageID.82470).

None of these facts warrant exclusion of Dr. Georgopoulos' careful use of population-wide studies for the purposes upon which he relied on them. They are again, at most, properly addressed on cross examination.

[35] *See* Richard Casey Sadler, *How ZIP codes nearly masked the lead problem in Flint*, The Conversation (Sept. 19, 2016), *available at:* https://theconversation.com/how-zip-codes-nearly-masked-the-lead-problem-in-flint-65626.

d. Defendants have replicated Dr. Georgopoulos' methodology using the same data and methods, so their arguments regarding an inability to do so are moot.

Lastly, Defendants seek exclusion of Dr. Georgopoulos' AALM blood lead simulations because, they argue, that "[s]omeone else using the same data and methods [should] be able to replicate the result[s]." ECF No. 2483 (2023 Georgopoulos Motion), PageID.82237–38 (citing *City of Pomona v. SQM N. Am. Corp*., 750 F.3d 1036, 1047 (9th Cir. 2014)). Class Plaintiffs provided Defendants all of the model inputs and data upon which they could replicate Dr. Georgopoulos' work. Ex. 10 (2023 Georgopoulos Dep.) at 150:17–151:24.

The report of Dr. Brent Finley includes charts indicating that he replicated Dr. Georgopoulos' modeling with different input variables to demonstrate his points regarding (a) reduced water ingestion at a higher water lead level that was Dr. Georgopoulos used for his baseline, and (b) how 10% incremental increases in other lead exposure pathways would impact blood lead levels. ECF No. 2461-8 (Feb. 2023 Finley Decl.), PageID.80116 (Tables 6 & 7). The report of Dr. William Huber also indicates that he "began [his] review by attempting to reproduce the AALM results that form[ed] the basis of Dr. Georgopoulos' conclusions." Ex. 12 (Huber Decl.) at 4. Dr. Huber also "re-ran the scenarios by modifying [Dr.] Georgopoulos['] files to extend the time period of the calculation … by six years," *Id*. at pp. 8, 26, Fig. 8. As

Defendants' experts were able to replicate, and then manipulate, Dr. Georgopoulos' modeling, this argument is erroneous.

The defense expert replication of Dr. Georgopoulos' AALM modeling work should dispose of this argument. If, however, Defendants' argument is that the exposure to lead endured by Flint residents should be replicated so as to measure the elevations in blood lead attributable to ingestion of increased concentrations in water lead, such replication would be absurd. "[E]xperimental human studies cannot intentionally expose subjects to toxins…" Michael D. Green, *Reference Guide on Epidemiology*, in Federal Judicial Center, Reference Manual on Scientific Evidence 549, 555 n.14 (3d ed. 2011).

As with Class Plaintiffs' other experts, the motion to exclude Dr. Georgopoulos' expert testimony should be denied.

5. Dr. Howard Hu

Dr. Hu is a qualified physician-scientist, epidemiologist, internist, and preventive medicine specialist. He presently serves as a tenured Professor of Preventive Medicine and is Chair of the Department of Population and Public Health Sciences at the University of Southern California Keck School of Medicine. ECF No. 2461-3 (2022 Hu Decl.), PageID.79854. He is also an Affiliate Professor at the University of Washington and an Adjunct Professor at the University of Michigan. *Id*. Among a long list of prior positions, Dr. Hu has served as Founding Director of

the U.S. National Institute for Environmental Health Sciences (NIEHS) Environmental Health Core Sciences Center while he was also an Associate Physician at the University of Michigan Health System; and as Director of the Occupational Medicine Residency at the Harvard School of Public Health. *Id*., PageID.79854–55.

Dr. Hu has extensive experience with peer-review and publication and is well respected in his field. Since 1990, he has led multi-institutional and international teams of scientists, students and fellows devoted to investigating the environmental, nutritional, social, psychosocial, genetic, and epigenetic determinants of chronic disease and impaired child development in population-based studies in the U.S., Mexico, India, China, and around the world. *Id*., PageID.79855–56. Together with these teams, Dr. Hu has helped generate over 350 publications in the peer-reviewed literature and won several awards such as the 1999 Progress and Achievement Award from the NIEHS, the 2009 Linus Pauling Lifetime Achievement Award, the 2011 Award of Excellence from the American Public Health Association, and the 2015 John Goldsmith Award for Outstanding Contributions from the International Society for Environmental Epidemiology. *Id*.

Over 200 of Dr. Hu's publications have focused on investigations of lead exposure and the resulting impacts on health, including research relevant to IQ and cognition, behavior, educational attainment, physical growth, blood pressure,

cardiovascular impacts, and renal function. ECF No. 2461-3, PageID.79856. Dr. Hu has authored the Chapter on "Heavy Metals" for each edition of Harrison's Principles of Internal Medicine, which is one of the most widely read and authoritative medical textbooks in the world. *Id.*, PageID.79857. He also has hands-on experience as the primary consultant in occupational/environmental medicine for over 100 cases of suspected lead toxicity. *Id*. His methods and approach to providing opinions and testimony in this matter are founded in scientific principles for which he literally writes the textbook, and should be admitted.[36]

a. Dr. Hu's opinion as to adverse cardiovascular health effects meets FRE 702 admissibility standards.

Dr. Hu's opinion that elevation in blood lead levels poses elevated risks of adverse cardiovascular outcomes, including prospective risk of cardiovascular mortality, is admissible under FRE 702 because it is based on his knowledge of the effects of hypertension on cardiovascular health, as well as his research and peer-

[36] Defendants moved to exclude Dr. Hu's opinions and testimony regarding elevated blood lead level causing immunological health effects. Although Class Plaintiffs included adverse immunological health effects on the list of harms (ECF No. 2283 (Class Plaintiffs' Notice)), Class Plaintiffs no longer intend to present testimony at trial to establish, for purposes of general causation, that elevated levels of blood will more likely than not cause adverse immunological health effects, thereby mooting this aspect of Defendants' motion.

reviewed publications involving investigations of lead exposure and resulting impacts on health including cardiovascular effects.[37]

Dr. Hu opines that modest elevations of lead in blood "are a cause of clinically-significant elevations in blood pressure as well as the risk of clinical hypertension, which, in turn, pose elevated risks of adverse cardiovascular outcomes (e.g., myocardial infarction, stroke). These risks are generally greater with greater elevations in lead exposure." ECF No. 2461-3, PageID.79860. In his rebuttal declaration, Dr. Hu cited a recent study by Lanphear et al. (2018)[38] of blood lead levels and mortality using data from the U.S. National Health and Nutrition Examination Survey. The study demonstrated that an increase in the concentration of lead in blood from 1.0 µg/dL to 6.7 µg/dL was found to be associated with all-cause mortality, cardiovascular disease mortality, and ischemic heart disease mortality. ECF No. 2461-4 (2023 Hu Rebuttal Decl.), PageID.79992.

Dr. Hu also opines as follows:

> There also is some research suggesting that relatively modest elevations in blood lead levels are prospectively associated with increased risk of cardiovascular mortality in the general population *independent of its impact on blood pressure or hypertension*; however, in my opinion, the evidence base for this particular lead-outcome relationship is not

[37] Dr. Hu served as an expert peer reviewer of the most recent U.S. EPA draft report on *Concentration-Response Functions between Lead Exposure and Adverse Health Outcomes for Use in Benefits Analysis: Cardiovascular-Disease Related Mortality*. ECF No. 2461-3, PageID.79857.

[38] Bruce P. Lanphear et al., *Low-level lead exposure and mortality in US adults: a population-based cohort study*, 3 Lancet Pub. Health. e177 (2018).

> sufficient for me to come to a conclusion regarding causality, in part, because of the lack of epidemiological that can disentangle the independent impacts of lead on cardiovascular from the impacts of lead on blood pressure or hypertension; and in part because it is unclear whether these risks relate to blood lead levels as a biomarker of on-going current exposure v. cumulative past exposure (that had typically accumulated over the course of many years).

ECF No. 2461-3, PageID.79874.

VNA moves for summary judgment based upon the above cited paragraph, but presents an argument that surgically excises the most important (and italicized) qualification to Dr. Hu's opinion; ***independent of its impact on blood pressure or hypertension***. *Compare* ECF No. 2461-3, PageID.79874, *with* ECF No. 2461, PageID.79830. Dr. Hu emphasized the significance of this qualification in deposition in response to questions from VNA's counsel:

> Q. Okay. Focusing — on an increased blood lead level as an independent cause of cardiovascular mortality, you agree that science does not support a causal relationship at this stage, correct?
>
> A. It doesn't support a causal relationship ***independent of the lead's impact on blood pressure and hypertension and would I not subscribe to that statement without the last phrase that I said, independent of its effect -- impact on blood pressure or hypertension.***

Ex. 13 (2022 Hu Dep.) at 188:14–24 (emphasis added). By removing this qualification, VNA is twisting Dr. Hu's opinion. There is no question that lead exposure causes increased cardiovascular mortality. The only question is whether that general causation opinion is independent of, or dependent upon, lead's demonstrated effect on clinical hypertension, heart attacks and stroke. As Dr. Hu

emphasized in deposition, "[w]ell, I mean, ***lead exposure is definitely associated with increased cardiovascular mortality***, but is it occurring, as I put in italics, independent of its effect on blood pressure or hypertension remains to be seen. *Id*. at 188:2–6 (emphasis added).

Dr. Hu's opinion is appropriately qualified, given the current state of the academic and epidemiological literature. And a proper *Daubert* analysis should not preclude him from providing the same opinion, with the same qualifications, at trial. Dr. Hu's testimony should be admitted and Defendants may cross examine him on the qualifications associated with the opinion.

b. Dr. Hu's opinion as to adverse reproductive health effects Meets FRE 702 admissibility standards.

Defendants' motion attacks Dr. Hu for citing to the ATSDR as support for his opinions on reproductive health effects caused by lead exposure. ECF No. 2461, PageID.79832. The 2020 ATSDR Toxicological Profile of Lead builds on authoritative reviews by the NTP and EPA that draw conclusions regarding causal relationships between lead exposure and a variety of health effects, including reproductive function. ECF No. 2461-4, PageID.80016–17. The ATSDR conducted thorough literature searches from 2013 to 2019 to identify studies, and then applied a rigorous set of criteria in consideration of which studies to include in the profile. *Id*. The ATSDR concludes that health effects on the male reproductive system might

include damage to sperm and hormones and decreased fertility.[39] For females, studies show evidence of alterations in reproductive hormone levels with increased lead exposure, as well as decreased fertility, increased spontaneous abortion, increased preterm birth, and earlier age at onset of menopause. *Id*.

Defendants' motion ignores the references to any of the adverse reproductive health effects literature cited in Dr. Hu's rebuttal declaration, including the following:

- Since 2013, the U.S. EPA has concluded that there is a likely causal relationship between lead exposure and impaired male reproductive function. (ECF No. 2461-4, PageID.80017).[40]
- The findings of Ou et al. (2020) demonstrate an adverse impact on reproductive health in women, i.e. increased risk of spontaneous abortion at levels of blood lead below 5µg/dL. (*Id*., PageID.79978–79).
- A study by Vigeh et al. (2011) of blood lead levels in pregnant women and associated impacts on duration of gestation suggests that lead exposure associated with blood lead levels less than 5µg/dL pose a risk of preterm birth. (*Id*., PageID.79980).

Dr. Hu relies on this wide scientific foundation in forming his opinions. His testimony regarding reproductive health effects is admissible.

[39] Agency for Toxic Substances and Disease Registry (ATSDR), U.S. Dep't of Health & Human Servs., *Toxicological Profile for Lead*, at 7 (2020).
[40] Citing U.S. EPA, *Integrated Science Assessment (ISA) for Lead (Final Report, Jul 2013)*, EPA/600/R-10/075F, at p. 1-15 Table 1-2, pp. 1-36 to 1-37 (2013).

c. Defendants do not challenge the reliability of Dr. Hu's *in utero* adverse health effects opinions under *Daubert* and the Court should defer ruling on their relevance until motions *in limine* are presented.

Dr. Hu also opines about the adverse health effects of lead on children, as well as cognitive impairment of fetuses exposed to lead *in utero*. VNA does not challenge these opinions with respect to children. However, VNA seeks to exclude the opinion related to *in utero* exposure on relevance—not *Daubert*—grounds because fetuses are not part of the adult issues Class. ECF No. 2461, PageID.79865–67. These arguments are more appropriately brought as a motion *in limine* and are not appropriately considered now.

But to briefly address the relevance of these issues, Plaintiffs identified "emotional trauma and negative mental health outcomes" as one of the enumerated harms that exposure to contaminated water is capable of causing for adult Class Members. ECF No. 2283, PageID.74158. It is easily foreseeable that an adult Class Member who learns that their grandchild, child, fetus or another child with whom they are close has been exposed to elevated levels of lead and may suffer adverse health effects as a result. Adult Class Members are entitled to seek damages for mental anguish and/or emotional distress damages under such circumstances. "Mental anguish" encompasses emotional pain and suffering, fright and shock, embarrassment, humiliation, or mortification. *McClain v. Univ. of Michigan Bd. of Regents*, 256 Mich. App. 492, 498–499, 665 N.W.2d 484 (2003), *superseded by*

statute on other grounds as noted in Simpson v. Pickens, Jr., & Assocs., MD, PC, 311 Mich. App. 127, 135 n.6, 874 N.W.2d 359 (2015). "[T]he question is whether the mental suffering and injury to feelings are natural and proximate in view of the nature of the defendant's conduct." *Green v. Evans*, 156 Mich. App. 145, 153, 401 N.W.2d 250 (1985).

The fact that exposure to elevated levels of lead is injurious to children and fetuses is an appropriate issue for Class Plaintiffs to address, as a matter of general causation, in the issues trial. Whether any specific adult Class Member suffered mental anguish or emotional distress injuries as a result of a child or fetuses' exposure to elevated levels of lead may be addressed in future proceedings.

d. Dr. Hu's opinions regarding the harms that Flint water is capable of causing are predicated upon reliable exposure assessment opinions of Drs. Weisel and Georgopoulos.

Dr. Hu describes a process by which he and his fellow experts performed an "assessment of exposures and associated doses to individuals":

> It utilizes a scientifically valid approach to conducting an exposure reconstruction based on available information to determine the range of likely water lead levels encountered by Flint residents during the Flint Water Crisis and what can be expected in terms of the likely resulting elevations in blood lead levels in Flint residents who are now adults.

ECF No. 2461-3, PageID.79864. Dr. Hu observes that "[t]he task inherently requires a trans-disciplinary approach that integrates principles and methods related to water quality, chemistry, materials science; civil/environment engineering, exposure

science, biological dosimetry, toxicokinetics, environmental epidemiology, and general environmental health." *Id*. Accordingly, in order to evaluate whether Flint water ingested during the Class Period was capable of causing harm to Class Members, Dr. Hu relies upon the expert opinion of others (Drs. Russell, Weisel, and Georgopoulos), as well as the discovery record and academic literature, to review the range of water lead levels to which Class Members in Flint were exposed. From such exposures, Dr. Hu then presents an array of adverse health effects that such levels of exposure are capable of causing.

Again, VNA's challenges to Dr. Hu's work, and the exposure assessment upon which it is predicated, improperly address the conclusions reached rather than the methodology applied. And in many respects, the critiques rely upon the opinions of Dr. Finley's competing interpretation of the distribution of elevated lead levels throughout Flint's drinking water infrastructure, and his competing interpretation of water lead levels and blood lead levels. As set forth *supra,* in § II(E), the competing views presented by opposing experts do not form an appropriate basis for exclusion of expert testimony under *Daubert***.**

Most of VNA's challenges to Dr. Hu's opinions, presented at pages 15–25 of their brief, are actually a challenge to the underlying exposure assessment work of these other experts, and in particular Dr. Georgopoulos. ECF No. 2461,

PageID.79836–846. Those critiques are addressed in detail in response to VNA's motion to exclude Dr. Georgopoulos' opinion, *supra* § III(B)(4).

VNA further presents an array of generalized arguments that are also based upon what it characterizes as "the most plausible exposure scenario," which is premised upon contested calculations of water levels during the crisis. ECF No. 2461, PageID.79840–42. But even if one accepts VNA's interpretation of the data, by definition, VNA's selection of the "median" water lead levels means that half of Flint's population would have been exposed to higher amounts of lead than those amounts presented in VNA's "most plausible" scenario.

Further, although VNA relies upon a "median" water lead increase of approximately 2.5 ppb, ECF No. 2461, PageID.79841, the water sampling data taken during the crisis period reveals multiple homes out of the 268 that were tested in Flint that were exposed to lead levels ranging from 10 ppb up to 1051 ppb (including Class Representative Rhonda Kelso's level of 66.2 ppb). ECF No. 1208-129 (VATECH_00212274). Indeed, Dr. Weisel notes that 17% of the Flint homes tested exceeded the EPA action level of 15 µg/L. ECF No. 2455-3, PageID.77880. If this same percentage were applied city-wide to the roughly 40,000 homes in Flint, then 6,800 houses would have exceeded the EPA action level. VNA similarly misapplies population-wide epidemiological studies with noted shortcomings that are addressed *supra*, § III(B)(4) (addressing challenges to Dr. Georgopoulos' opinions).

VNA will have an opportunity to present its competing arguments to a jury for evaluation. But they do not provide an appropriate basis for exclusion of Dr. Hu's testimony.

Finally, VNA asserts that Plaintiffs rely upon a "no threshold" theory of general causation. ECF No. 2461, PageID.79842–46. Yet throughout Dr. Hu's reports are specifications of specific blood lead levels for which adverse health effects are identified. *See, e.g.*, ECF No. 2461-3, PageID.79869–870 (identifying hypertension risks associated with BLLs ranging from mean concentrations of .92 µg/dL to 4.4 µg/dL); *id.*, PageID.79871 (identifying worsened neurological functions at BLL within 5 or 10 µg/dL); *id.*, PageID.79872 (identifying impaired kidney function within 5 or 10 µg/dL); *see also* ECF No. 2461-4, PageID.79978–79 (identifying increased risk of spontaneous abortion at less than 5 µg/dL).

Furthermore, Michigan law recognizes that, for toxins where there is "no safe level" of exposure, such evidence is an admissible basis upon which to conclude that exposure to the toxin has caused injury. *Chapin v. A & L Parts, Inc.*, 274 Mich. App. 122, 732 N.W.2d 578 (2007). In *Chapin*, plaintiffs' expert pointed to the findings of "governmental health organizations" who had drawn conclusions that there was "no safe level." The Court found plaintiffs' expert's opinion "objective, rational, and based on sound trustworthy literature" and allowed the expert testimony. *Id.* at 140.

The Michigan Supreme Court denied leave. *Chapin v. A & L Parts, Inc*., 480 Mich. 879, 737 N.W.2d 774 (2007).

This Court has already rejected the argument presented by VNA in an earlier bellwether case, holding as follows:

> VNA argues, courts routinely disallow testimony to the effect that any dose of a toxin can cause harm. Indeed, VNA claims that a "bedrock principle of Michigan law" prohibits such testimony. VNA is incorrect. There is no general rule prohibiting an expert from opining that a toxin can cause harms at any level of exposure, so long as that opinion is otherwise reliable. In fact, there is no blanket prohibition on testimony with any particular content, because that would be fundamentally inconsistent with *Daubert*.

In re Flint Water, 2021 WL 5631706, at *3. Similar to its earlier ruling, the Court should reject VNA's *Daubert* challenge to Dr. Hu's testimony.

6. Dr. Robert A. Michaels

Dr. Michaels is a renowned toxicologist with decades of experience doing exactly what he has been asked to do in this case: evaluating the relationship between health risks and environmental contaminants. Dr. Michaels employed the Bradford Hill methodology to analyze general causation with respect to contaminated water during the Flint Water Crisis and skin rashes, a methodology that has been widely accepted in the scientific and medical communities and routinely accepted in federal courts.

In moving to exclude Dr. Michaels' testimony, VNA mostly ignores his qualifications and methods. Instead, VNA presents a hodgepodge of

mischaracterizations of Dr. Michaels' methodology and incomplete (or outright false) statements about the sources upon which Dr. Michaels relies.

VNA's arguments are yet again, if anything, potential fodder for a cross-examination of Dr. Michaels at trial. VNA presents no valid basis to exclude Dr. Michaels' opinions. Accordingly, the Court should deny VNA's motion.

a. Dr. Robert Michaels is qualified and used a sound methodology.

Dr. Michaels is a toxicologist with 30 years of experience assessing and managing the risks to public health posed by environmental contaminants. ECF No. 2456-3 (2022 Michaels Rpt.), PageID.78263. Dr. Michaels currently serves as the President and Chief Consulting Scientist at RAM TRAC Corporation in Schenectady New York, where he has been since 1986. *Id*. RAM TRAC provides objective consulting services on environmental toxicology, human health risk assessment, and toxicological risk management. Dr. Michaels has served government clients at the Federal, State, and Municipal levels, and has also served as a staff toxicologist for the Natural Resources Defense Council (NRDC), a public interest organization. He also chaired the State of Maine Scientific Advisory Panel and chaired the Certification Review Board of the Academy of Board-Certified Environmental Professionals (ABCEP) for twenty (20) years. *Id*. VNA does not challenge Dr. Michaels' credentials or qualification as an expert witness.

In this case, Dr. Michaels was asked to evaluate the narrow ***general causation*** issue: whether the contaminated water in Flint from April 25, 2014 until October 16, 2015 was ***capable of causing*** skin rashes among exposed Flint residents. As previously discussed, this question is distinct from a question of specific causation, i.e., whether exposure to the water more likely than not caused a particular plaintiff's injury. *See generally Lowery*, 898 N.W.2d at 914 (Markman, Concurring).

In an effort to discredit Dr. Michaels and exclude his opinions from the jury, VNA mischaracterizes his methodology and distorts his opinions. VNA focuses its motion on a single source relied upon by Dr. Michaels called the *Flint Rash Investigation*, which was conducted by a collaboration of local, state, and federal health and environmental agencies called the Unified Coordination Group ("UCG Report"). VNA wrongly suggests that Dr. Michaels relied entirely on this report. In fact, while the UCG Report is a valuable resource for Dr. Michaels because it "develop[ed] detailed data on skin rashes and hair loss among a reasonably large number of Flint study participants," the UCG Report is only one of an extensive repository of sources Dr. Michaels relies upon to analyze the association between contaminated water in Flint and the prevalence of skin rashes. *See* ECF No. 2456-8 (2023 Michaels Rebuttal Rpt.), PageID.78611–12.

Dr. Michaels analyzes general causation using a methodology widely accepted in the scientific community, called the Bradford Hill criteria. ECF No.

2456-3 (2022 Michaels Rpt.), PageID.78233. The Bradford Hill criteria include nine factors, which, evaluated together, "produce[] a judgment of the weight of evidence supporting a causal or a casual association." *Id*., PageID.78233–34. Dr. Michaels applies these criteria, along with his extensive professional experience and literature review, determining that "the weight of evidence [is] clearly in support of the general causation hypothesis associating corrosive Flint municipal water conditions with skin rashes, hair loss, and other skin conditions." *Id.* In doing so, Dr. Michaels cites ***54 literature sources***, including textbooks, peer-reviewed studies, and anecdotal evidence, alongside the UCG Report, in support of his conclusions with respect to each of the nine Bradford Hill criteria. *See* ECF No. 2456-8 (2023 Michaels Rebuttal Rpt.), PageID.78611–12. VNA's Motion simply ignores 53 of these literature citations and suggests that limitations in one of them—the UCG Report—is the end of the story.

VNA also mischaracterizes the UCG Report itself. VNA cherry-picks sentence fragments and strings them together in a misleading paraphrase. *See* ECF No. 2456 (2023 Michaels Mot.), PageID.78197–98. VNA's motion claims the following:

> Ultimately, the UCG found that "the lack of historical data on either rash patterns in the community or residence-specific water samples from that time period made it "impossible" to "draw definitive conclusions" about ***whether Flint River water could have caused skin conditions***.

Id., PageID.78192 (emphasis added).

But the paragraph from which VNA assembles its partially quoted phrases begins with this full sentence from the August 2016 UCG Report: "While we were unable to find a consistent pattern relative to the rashes and ***current water quality***, our findings were limited by the lack of historical data." ECF No. 2456-5 (UCG Report), PageID.78345 (emphasis added). That sentence does not say, as VNA suggests, that the authors of the UCG Report "could not draw definitive conclusions" about whether the ***Flint River water*** caused rashes; it was about whether the August 2016 "current water quality"—after the City of Flint switched back to the Detroit water source—caused rashes.

Contrary to VNA's misleading word scramble, Dr. Michaels does not rely upon or contradict conclusions from the UCG Report, as that report focused on a different time period and a different water source. *See* ECF No. 2456-8 (2023 Michaels Rebuttal Rpt.), PageID.78610. The UCG Report is a valuable resource for Dr. Michaels not for its conclusions about a separate subject, but because it "developed much valuable screening data on rash cases to identify those with onset during the Flint Water Crisis" and is in fact the only study regarding skin rashes among Flint residents." *See id*. at 4, 16. Dr. Michaels relies, in part, on that screening data itself—as well as 53 other sources, to evaluate the narrow issue of general causation on which he presents his opinion.

b. VNA's arguments do not establish a basis to exclude Dr. Michaels.

VNA relies upon its misleading description of Dr. Michaels's methodology and the UCG Report to argue that the Court should exclude Dr. Michaels under FRE 702.

i. VNA mischaracterizes Dr. Michaels's Bradford Hill analysis.

VNA concedes that Dr. Michaels employs the well-accepted and "generally reliable" methodology for evaluating general causation in the scientific community. ECF No. 2456, PageID.78195. Nevertheless, VNA grossly mischaracterizes Dr. Michaels's analysis in order to suggest that this particular version of the well-accepted methodology is unreliable.

First, VNA argues that Dr. Michaels inappropriately employed the Bradford Hill methodology because he did not first conduct or cite a "peer-reviewed stud[y] demonstrating statistical association between the constituents of 'corrosive' water and skin rashes." *Id*., PageID.78197. VNA's argument fails because it relies on mischaracterizations of the law, and mischaracterizations of Dr. Michaels's analysis.

Judge Stengel of the Eastern District of Pennsylvania explained the flaw of VNA's argument when rejecting a similar motion to exclude an expert in *In re: Tylenol (Acetaminophen) Marketing, Sales Practices, & Product Liability Litigation*, 2016 WL 4039286, at *7 (E.D. Pa. July 28, 2016). Judge Stengel held:

> The defendants' interpretation of the type of association needed before using Bradford-Hill is overstated. There is nothing to say that a statistically-significant association must be found before applying the methodology. In fact, the whole point of using the Branford-Hill methodology is to test an observational association to show causation. *See In re: Lipitor (Atorvastatin Calcium) Marketing, Sales Practices and Products Liability Litigation*, ___ F.Supp.3d ____, MDL No. 2:14–mn–02502–RMG, 2016 WL 1251828, at *2 (D.S.C. Mar. 30, 2016) ("Randomized, double-blind, clinical trials are the 'gold standard' for determining whether an association exists. However, the Reference Manual on Scientific Evidence recognizes that observational studies can be sufficient to establish an association.") (citation omitted); Federal Judicial Center, Reference Manual on Scientific Evidence, at 598-99 (3d ed. 2011) (recognizing that an association is needed first to apply Bradford Hill but not a statistically significant one); id. at 217-18 (recognizing the role of observational studies in establishing causation). If an expert has found a statistically-significant association, there seemingly would be no need to test the association using the Bradford-Hill guidelines.

Id. at *7 n.19.The cases cited by VNA do not contradict Judge Stengel's holding. The first case VNA cites is a Fourth Circuit case, *In re Lipitor (Atorvastatin Calcium) Marketing, Sales Practices and Products Liability Litigation*, which addressed a district court order regarding the admissibility of an expert opinion drawing an association between diabetes and a 10 mg dose of Lipitor. In that case, the Fourth Circuit explained: "[The district] court focused on the particular analysis Dr. Singh performed—applying the Bradford Hill criteria to a set of data—and determined that ***in that specific context***, the analysis requires a statistician to find a statistically significant association at step one before moving on to apply the factors at step two." 892 F.3d 624, 642 (4th Cir. 2018) (emphasis added). The Fourth Circuit

did not find that there was such a requirement in all contexts—especially in a case involving a complex mixture of water contaminants that would be difficult to replicate in any controlled study. In the other case VNA relies upon, VNA cites a reference the Southern District of New York makes to what "several courts" have done, ECF No. 2456 at PageID.78196 (citing *In re Fosamax Prod. Liab. Litig.*, 645 F. Supp. 2d 164, 188 (S.D.N.Y. 2009), but omits the very next sentence which says: "The record here is inconclusive on this point," *In re Fosamax*, 645 F. Supp. 2d at 188. In the same order, the district court explained: "It is well-settled that an expert on medical causation need not always base his opinion on epidemiological studies." *Id.* at 176 (citing cases).

Even putting aside VNA's misstatement of the law, VNA simply ignores the references that Dr. Michaels relies upon to support an association between the Flint municipal water and skin rashes. As Dr. Michaels explains in his report: "The plausibility, coherence, and experimental evidence of the association of rashes with the corrosive condition of Flint municipal water are well-established by medical, toxicological, and other scientific literature relating to individual components of Flint municipal water, such as metals known to be associated with causation of allergic contact dermatitis, such as arsenic, chromium, cobalt, copper, nickel, silver, thallium, and zinc (see *Discussion*)." ECF No. 2456-3 (2022 Michaels Report),

PageID.78239. In support, Dr. Michaels cites a Toxicology textbook, *Casarett and Doull's Toxicology – The Basic Science of Poisons* (4th Ed., 1991), which states:

> There are a wide range of situations in which sensitized subjects can contact antigens in a manner that will lead to development of contact dermatitis… Common sources include, but are certainly not limited to, contact with metals (nickel); metal compounds (nickel, chromium, cobalt salts, and organomercurials)…

Id. Dr. Michaels also cites another textbook, *Environmental & Occupational Medicine* (edited by William S. Rom, 1998), for its discussion of "numerous skin toxicity effects of metals," including "common metallic skin allergens: beryllium, chromium, cobalt, gold, mercury, nickel, and palladium." *Id*. And Dr. Michaels cited the UCG Report itself, which contained its own detailed literature review presenting additional sources supporting an association between skin irritation and the parameters of the Flint River water:

> During the time that Flint municipal water was fed by the Flint River, the system experienced substantial variations in water quality parameters (e.g., pH, hardness, alkalinity, and chlorine). There is some evidence from the scientific literature of an association with skin and eye irritation and these parameters (Perkin, 2016; McNally, 1998; Miyake, 2004; Arnedo-Penn, 2007).

Id., PageID.78240–41 (citing UCG Report).

Accordingly, VNA's argument simply ignores the extensive literature Dr. Michaels relies upon to evaluate the relationship between the parameters of the water in Flint during the Flint water crisis (e.g., pH, hardness, alkalinity, chlorine, and the

existence of certain metals) and skin rashes. VNA's motion should be denied on that basis.

Second, VNA presents the same misleading and inaccurate picture of Dr. Michaels's report in arguing that his opinions should be excluded because he did not apply the Bradford Hill criteria to the "entire body of scientific evidence for a particular exposure and disease relationship." ECF No. 2456, PageID.78197. In making this argument, VNA does not list even one resource that VNA believes Dr. Michaels should have included, but did not include. Instead, VNA asserts without support that Dr. Michaels "relies virtually exclusively on the UCG Report." *Id*., PageID.78198.

Dr. Michaels resoundingly refuted this argument in his rebuttal report. In that report, he lists the 54 literature citations he cited in his original support that "specifically support the association with skin rashes of numerous known components of Flint water during the FWC, and the high probability of synergism: that such substances acting together, simultaneously and/or sequentially in a mixture, would be more potent than the same substances acting individually." ECF No. 2456-8 (Michaels Rebuttal Rpt.), PageID.78612–13. Further, Dr. Michaels presents a table listing each of these 54 literature citations and identifying the Bradford Hill criteria to which each source relates. *Id*., PageID.78612, Table 1. VNA simply ignores these references.

If VNA is aware of relevant literature that Dr. Michaels should have considered, but did not, VNA may have an opportunity to use those resources to impeach Dr. Michaels during cross-examination. But VNA's vague allusions to "the entire body of scientific evidence," ECF No. 2456, PageID.78197, does not constitute any valid basis to exclude Dr. Michaels from testifying, *see S.E.C. v. Johnson*, 525 F. Supp. 2d 70, 76 (D.D.C. 2007) ("Defendants' criticism of Vondra's reliance on particular sources, bias embedded in his analysis, or his alleged misconstruction of facts would appear to serve better as fodder for cross-examination than as grounds for a ruling *in limine*.").

ii. VNA's arguments about language in the UCG Report rely on distortions of Dr. Michaels's analysis and of the UCG Report itself.

VNA next offers a series of arguments about the limitations of the UCG Report, or Dr. Michaels's reliance on that report. As an initial matter, VNA's arguments repeat the false narrative that Dr. Michaels relies "virtually exclusively on the UCG Report." ECF No. 2456, PageID.78198. As explained above, this simply is not true. In addition, VNA's arguments about the UCG Report do not hold water.

First, VNA repeats the same falsehood that the UCG Report itself contradicts Dr. Michaels's opinion that the water conditions in Flint were capable of causing skin rashes. The UCG Report does no such thing. VNA repeats its partial quotation of a sentence in the UCG Report, which explained that lack of historical data "make

drawing definitive conclusions impossible" and suggests that the UCG Report was referring to drawing conclusions about the capability to cause harm of the ***Flint River water*** during the Flint Water Crisis. ECF No. 2456, PageID.78198. As explained above, the partial quotation that VNA extracts here is explicitly about drawing conclusions regarding "current water quality" as of August 2016, which was the post-Flint water crisis period. ECF No. 2456-5, PageID.78345–46. Additionally, while the UCG Report does not purport to analyze the questions Dr. Michaels considered—whether the water conditions during the Flint water crisis were capable of causing skin rashes among exposed Flint residents—the UCG Report makes several statements supporting Dr. Michaels's opinions. For example, the UCG Report states the following:

- "A review of historic system water quality data from the period of time when Flint River water was used as the source (April 2014–October 2015) demonstrated significant variability in water hardness, pH/acidity, and free chlorine levels that could have played a role in skin and other irritant health effects. During that time, pH, chlorine, and water hardness levels were all higher than they were when measured for this study." ECF No. 2456-5 (UCG Report), PageID.78344;

- "During the time that Flint municipal water was fed by the Flint River, the system experienced substantial variations in water quality parameters (e.g., pH, hardness, alkalinity, and chlorine). There is some evidence from the scientific literature of an association with skin and eye irritation and these parameters (Perkin, 2016; McNally, 1998; Miyake, 2004; Arnedo-Penn, 2007)." *Id*., PageID.78348;

- "Since a majority of rashes began while residents were using the Flint River water source, the fluctuations in water quality during that time provide one

possible explanation for a majority of the eczema-related diagnoses made by the dermatologists." *Id*., PageID.78344; and

- "The metals and other water characteristics that were chosen for this component of the analysis were those for which evidence exists in the scientific literature of an association with adverse skin effects: arsenic, chromium, copper, water hardness, nickel, silver, thallium, zinc, pH, and chlorine." *Id*., PageID.78371.

All of these statements served to bolster Dr. Michaels's opinions regarding the capability of the Flint water, ***during the Flint Water Crisis***, to cause skin rashes to exposed residents.

Second, VNA argues that Dr. Michaels "misunderstands the significance" of the UCG Report's statement that "[more respondents reported rash onset dates before October 2015 (56%; n=189 of 339) compared with after October 2015 (44%; n=149 of 339)." ECF No. 2456, PageID.78199. VNA offers the opinion of a witness hired by VNA, who claims the difference between 56% and 44% is "essentially a coin toss." *Id.*

VNA's argument goes to the weight of Dr. Michaels opinions, rather than providing any reason to exclude Dr. Michaels from testifying under FRE 702. *See supra*, § II(D)-(E). Nevertheless, VNA does not actually provide any support for the idea that Dr. Michaels "misunderstands" the data presented in the UCG Report. It is not true that Dr. Michaels relies blindly on one statistic to infer general causation. Dr. Michaels relies on, among other things, "[t]he preponderance of people reporting a rash [who] also reported noticing changes in their tap water," and the demonstrated

"significant behavioral changes associated with bathing and showering due to health concerns associated with perceived water quality," to bolster his analysis regarding the strength of association between skin rashes and the Flint River water. *See* ECF No. 2456-3 (2022 Michaels Rpt.), PageID.78234–35. Moreover, there is no requirement that every component of an expert's methodology rely on a statistically significant relationship. *See Matrixx Initiatives, Inc. v. Siracusano*, 563 U.S. 27, 131 S. Ct. 1309, 1312 (2011) ("Matrixx's premise that statistical significance is the only reliable indication of causation is flawed. Both medical experts and the Food and Drug Administration rely on evidence other than statistically significant data to establish an inference of causation.").

Third, VNA pokes at a strawman when it says "the UCG Report was not designed to determine whether water from the Flint River caused skin rashes." ECF No. 2456, PageID.78199. This argument is a non-sequitur. Nowhere does Dr. Michaels say that the UCG Report was designed to determine whether water from the Flint River caused skin rashes. Dr. Michaels uses data and observations developed by the UCG Report, but his opinions on general causation reflect the application of nine Bradford Hill criteria, Dr. Michaels "scientific training and experience, and [ ] consideration of extensive, relevant medical, toxicological, and other scientific literature," including 54 items specifically listed and cited. *See* ECF

No. 2456-3 (2022 Michaels Rpt.), PageID.78231–34; ECF No. 2456-8 (Michaels Rebuttal Rpt.), PageID.78612.

Fourth, VNA miscites Dr. Michaels, falsely arguing that Dr. Michaels called the UCG investigation a "before versus after" study design. *See* ECF No. 2456, PageID.78200 ("Dr. Michaels contends that the UCG investigation was a 'before versus after' study design . . . ."). In fact, the Dr. Michaels sentence VNA *partially* quotes, says in full: "Notwithstanding similarities with other incidents, the Flint Water Crisis may be studied best by comparing epidemiology data before vs. after its onset, essentially using Flint its own scientific 'control' case." ECF No. 2456-3 (2022 Michaels Rpt.), PageID.78241. Dr. Michaels used data reported in the UCG Report to make this comparison, but he did not falsely characterize the purpose of the URG Report itself. VNA's resort to mischaracterizations and partial quotations betrays the weakness of its motion.

VNA does not present a single mischaracterization of Dr. Michaels about the UCG Report or the purposes of that study. VNA's comments about limitations of the data contained in the UCG Report may be the subject of cross-examination, but they do not support a valid basis to exclude expert testimony. *See Hamilton v. Breg*, Inc., 2011 WL 833614, at *12 (S.D. Ohio Jan. 24, 2011) ("Neither *Daubert* nor Rule 702 demands absolute evidence of causation before an expert's testimony can be

admitted. Even with their limitations, the Beck, Matsen and Rapley studies are probative evidence on the issue of causation.").

iii. VNA's arguments about dose-response curves are misguided in the context of Dr. Michaels' analysis.

VNA argues that Dr. Michaels' analysis "lacks a reliable groundwork" because Dr. Michaels has not identified a specific dose-response curve for the complex mixture of water parameters that existed during the Flint water crisis and skin rashes that were prevalent among users of that water at the time. ECF No. 2456, PageID.78202–05. In making this argument, VNA cites authorities which state, in various ways, the obvious fact that level of exposure to a particular toxin is important in the context of toxicology and causation. *Id.*

VNA relies principally on two opinions involving the exclusion of expert testimony. The first opinion was Justice Markman's concurrence in *Lowery v. Enbridge Energy Ltd. Partnership*. In *Lowery*, the Michigan Supreme Court reversed an appellate opinion and reinstated an order granting summary judgment on behalf of a defendant in a toxic tort case. 500 Mich. 1034, 898 N.W.2d at 907. In his concurrence, Justice Markman explained that the expert opinion offered on behalf of the plaintiffs' case failed to establish both general and specific causation. *Id.* at 919–924. Specifically, the plaintiff was trying to establish that an oil spill and release of toxic chemicals caused plaintiff's severe coughing and vomiting, which then caused his gastric artery to avulse. *Id.* The plaintiff's only expert on the issue

was not a toxicologist, but was instead a general physician who reviewed case-related documents and a newspaper report of the oil spill and concluded that fumes from the oil spill caused the gastric artery avulsion. *Id.* at 909–910. Justice Markman found the plaintiff's expert unreliable, in part because the general physician "fail[ed] to address this critical point—i.e., whether plaintiff's level of VOCs exposure was capable of causing the level of vomiting necessary to cause a gastric artery to avulse." *Id.* at 919–920.

The second opinion is from an Eleventh Circuit case called *McClain v. Metabolife Int'l, Inc.*, 401 F.3d 1233 (11th Cir. 2005). In *McClain*, the plaintiff asserted that a combination of ephedrine and caffeine in Metabolife 365 caused them to suffer ischemic strokes and a heart attack. *Id*. at 1237. The Eleventh Circuit distinguished the case from "those cases in which the medical community generally recognizes the toxicity of the drug or chemical at issue" and found instead that it was a case "in which the medical community does not generally recognize the agent as both toxic and causing the injury plaintiff alleges." *Id*. at 1239. The court found that "The court need not undertake an extensive *Daubert* analysis on the general toxicity question when the medical community recognizes that the agent causes the type of harm a plaintiff alleges." *Id.* The expert at issue in *McClain* was also not a toxicologist, and he offered an opinion that ephedrine causes heart attacks and strokes based on "its classification as a sympathomimetic." *Id.* at 1241. The Eleventh

Circuit engaged in an extensive analysis of that expert's opinions, using criteria set forth in a toxicology article from 2003, *id.* at 1242–44, and the court found the expert's opinions unreliable for, among many other reasons, the expert's failure "to demonstrate a link between Metabolife and the types of injuries Plaintiffs suffered." *Id*.

Dr. Michaels' methodology and analysis is in stark contrast to the expert opinions that were excluded in *Lowery* and *McClain*. Unlike those experts, Dr. Michaels ***is a toxicologist***. He has a Ph.D. in Environmental Toxicology and more than 35 years of experience specializing in the assessment and management of risks to public health potentially posed by environmental contaminants. ECF No. 2456-3 (2022 Michaels Rpt.), PageID.78263. Unlike the thread-bare opinions excluded in *Lowery* and *McClain*, Dr. Michaels employs a widely accepted Bradford Hill analysis, evaluating nine scientific criteria for inferring general causation based on peer-reviewed studies, contemporaneous survey data, anecdotal evidence, and toxicology textbooks. *See id*., PageID.78233–254.

Also unlike the excluded experts in *Lowery* and *McClain*, Dr. Michaels has not been asked to present an opinion regarding a causal connection that is not recognized by the general medical community, such as the association between ephedrine and a heart attack or fumes from an oil spill and gastric artery convulsion. Dr. Michaels has been asked to evaluate general causation with respect to water with

elevated levels of chlorine, pH, water hardness, and metals observed in the Flint drinking water prior to October 2015, and skin rashes. As Dr. Michaels explains in his report, these constituent parameters are known in the scientific literature to be associated with skin rashes. *See, e.g.*, ECF No. 2456-3 (2022 Michaels Rpt.), PageID.78239–241 (citing multiple textbooks and other literature supporting proposition that "role of metals in inducing skin sensitivity has been known for decades, and has been accepted widely, to the point of being included in basic textbooks"); *Id*., PageID.78255 (citing Arnedo-Penn, A., *Domestic water hardness and prevalence of atopic eczema in Castellon (Spain) school children*, Salud Publica de Mexico (2007)); *Id*., PageID.78258 (citing Perkin, M.R. et al., *Association between domestic water hardness, chlorine, and atopic dermatitis risk early in life: a population-based cross-sectional study*, Journal of Allergy and Clinical Immunology (2008)); *Id.* (citing Miyake, Y., *Ecological association of water hardness with prevalence of childhood atopic dermatitis in a Japanese urban area*, Environmental Research (2004)); *Id*., PageID.78257 (citing McNally, N. J., *Atopic eczema and domestic water hardness*, Lancet (1998). Under the reasoning of *McClain*, because Dr. Michaels is presenting opinions about a causal connection between an agent and a harm known by the medical community to cause that harm, "[t]he court need not undertake an extensive Daubert analysis on the general toxicity question." *McClain*, 401 F.3d at 1239.

Despite the differences between the experts excluded from the cases that Veolia cites, Veolia seeks exclusion of Dr. Michaels report because Dr. Michaels explains that there was insufficient data available to quantify a dose-response curve for the mixture of constituent water parameters that existed in the Flint water during the Flint Water Crisis. ECF No. 2456, PageID.78204. However, because Veolia's arguments about a precise dose-response curve do not represent valid bases to exclude Dr. Michaels' opinions under FRE 702, the Court should deny Veolia's motion.

VNA cites no case that holds that precise information regarding threshold exposures and plaintiff exposure levels are required in order to render expert toxicology opinions admissible. Cases generally hold the opposite. Generally, "while precise information concerning the exposure necessary to cause specific harm to humans and exact details pertaining to the plaintiff's exposure are beneficial, such evidence is not always available, or necessary, to demonstrate that a substance is toxic to humans given substantial exposure and need not invariably provide the basis for an expert's opinion on causation." *Westberry v. Gislaved Gummi AB*, 178 F.3d 257, 264 (4th Cir. 1999) (admitting expert testimony that exposure to talc caused sinus problems despite inability to determine threshold level of exposure necessary to cause plaintiff's injuries); *In re Johnson & Johnson Talcum Powder Prod. Mktg., Sales Pracs. & Prod. Litig.*, 509 F. Supp. 3d 116, 179–80 (D.N.J. 2020) ("[T]he

dose-response factor need not be significant in order for an expert to, nevertheless, find a causative relationship, so long as there is reliable epidemiological evidence of a dose-response."); *Ferguson v. Riverside Sch. Dist. No. 416*, 2002 WL 34355958, at *6 (E.D. Wash. Feb. 6, 2002) ("The Court determines that the lack of a model for determining causation based on a 'dose-response' relationship does not undermine the reliability of [the expert's] testimony.").

VNA nevertheless goes on to suggest that Dr. Michaels' explanations of a generic dose-response curve and the synergistic relationship of exposure to multiple contaminants at once "do not cure" a failure to identify exposure levels. ECF No. 2456, PageID.78205. These arguments fail because VNA does not cite any case or authority stating that an expert need identify specific exposure levels when that data is unavailable. Veolia does not point to a problem that needs to be "cured."

Dr. Michaels explains that, through his literature review of peer-reviewed studies and texts, anecdotal evidence, and survey data from the UCG Report, he has sufficient evidence to infer general causation using the well-accepted Bradford Hill criteria, even if he cannot specify precise exposure levels. Dr. Michaels further elaborates with an analogy:

> I will add one further analogy: an example of injury and/or death attribution with variable but imprecisely known cause, illustrating that such variation may not justify reticence about causation attribution. Many house fires occur, including in Flint, with injury and death resulting in some cases. As in the Flint Water Crisis, injury and death might be attributed to some combination

> of smoke inhalation and fire, even if 'historical data' (measurements during the fire) are sparse, and even if such measurements fail to capture the spatial and temporal variation of house fires in Flint. Indeed, if a physical injury such as a wall collapsing and killing a victim is not evident, the death of the individual may be attributed to smoke and/or fire merely assuming that their intensity was sufficient to be lethal because, if they were not, the victim probably would be alive instead of dead.

ECF No. 2456-3 (2022 Michaels Report), PageID.78242–43. Dr. Michaels has established that the Flint water was contaminated with a mixture of parameters that each individually cause skin rashes, and examined evidence that rashes were more frequent and more severe when the City of Flint used corrosive Flint River water rather than water from the Detroit water source. He does not need to identify a precise dose-response curve to conclude that the contaminated water was capable of causing skin rashes, and VNA cites to authority stating otherwise.

iv. The unavailability of data measuring Chlorine, pH, water hardness, and metals in tap water in Flint residences during the period of February 10, 2015, through October 16, 2015, does not render Dr. Michaels' opinions unreliable.

VNA's next argument seeks to take advantage of further limitations in available data. VNA suggests that Dr. Michaels's opinions must be excluded because, while he reviewed data regarding levels of chlorine, pH, water hardness, and metals from water at the water treatment plant, there was not data available measuring those same parameters in tap water at Flint residences. ECF No. 2456,

PageID.78210–212. Again, VNA is simply ignoring the evidence that Dr. Michaels relies upon.

First, of course, Dr. Michaels relies on water quality data from the Flint Water Treatment Plant during the crisis. Elevated levels of chlorine, pH, water hardness, and metals in water from the treatment plant obviously constitute evidence of elevated levels of those same parameters in water at Flint residences, because the water flows from the treatment plant to those Flint residences. *See* ECF No. 2456-4 (Michaels Dep.), PageID.78312–13 (67:14–68:14).

Second, the UCG Report upon which Dr. Michaels relies does in fact include additional evidence of this clear correlation between the parameters of treatment plant water and residence water. The report found elevated levels of metals in water tested at Flint residences and concluded that the elevated metal levels resulted from the corrosive Flint River water distributed during the Flint Water Crisis:

> The water in some homes were found to have higher levels of metals (e.g. iron, aluminum, manganese) that are known to have an adverse effect on the taste and coloration of the water. The higher levels of these and some other metals in the water are likely the result of corrosion of water service lines and/or internal plumbing due to inadequate corrosion control when the Flint River served as the water source.

ECF No. 2456-5 (UCG Report), PageID.78344.

Third, VNA offers no evidence, or even speculation, suggesting that the relationship between water parameters at Flint residences and the water treatment plant during the Flint Water Crisis were anything other than highly correlated. There

is not much of an analytical gap required to assume that water parameters ***upstream*** in a distribution system will have a high correlation to water parameters downstream in the same system.

v. VNA offers no valid basis to exclude Dr. Michaels's opinions regarding hair loss of Flint residents.

VNA argues that Dr. Michaels' opinion that skin rashes among Flint residents were capable of causing hair loss should be excluded because Class Plaintiffs did not list hair loss as one of the harms they seek to prove during the issue-class trial. ECF No. 2456, PageID.78212. However, Dr. Michaels explains in his report that "chronic (long-term) exposure to corrosive Flint water conditions also, more probably than not, [was] capable of causing (at least temporary) hair loss ***as a secondary effect of long-duration scratching and scalp irritation***." ECF No. 2456-3 (2022 Michaels Report), PageID.78226 (emphasis added). Accordingly, Dr. Michaels' opinion regarding hair loss is relevant to the issue of general causation of ***skin rashes***, which is at issue. *See* ECF No. 2283 (Class Plaintiffs' Notice Regarding Certified Issue No. 3), PageID.74157. Because hair loss among the Class Plaintiffs was a secondary effect of long-duration skin irritation, evidence of hair loss among Flint residents will help demonstrate that the contaminated water was capable of causing the underlying skin rashes themselves.

VNA also asserts, without any explanation, that Dr. Michaels's opinion regarding hair loss "is pure speculation not founded on scientific evidence." ECF

No. 2456, PageID.78213. VNA simply ignores Dr. Michaels's Bradford Hill analysis. Dr. Michaels' report cites to evidence that, during the Flint Water Crisis, "skin rashes and hair loss constituted major health concerns of Flint residents." ECF No. 2456-3 (2022 Michaels Rpt.), PageID.78229. This evidence included survey data in the UCG Report, as well as sworn testimony of Flint residents. *See id*., PageID.78231, PageID.78236–38. Dr. Michaels noted that the UCG Report investigation "documented 390 rash and 175 hair loss complaints, with the majority of participants reporting changes in water quality when symptoms began." *Id*., PageID.78231 (quoting UCG Report).

VNA's motion ignores Dr. Michaels's evidence and methodology. The Court should deny the motion in full.

7. Dr. Daryn Reicherter

Dr. Reicherter, a board-certified psychiatrist with decades of experience as a world-renowned expert in the field of evaluating community trauma, proffers opinions that the Flint community, by being exposed to the overwhelming stressor of lead contaminated water that threatened the safety of the community, experienced community trauma. ECF No. 2459-3 (2022 Reicherter Decl.), PageID.79273, ¶ 21. Dr. Reicherter opines that precisely because Flint was already a vulnerable community before the water crisis due to low income and high poverty levels, depriving residents of access to safe drinking water—a basic human need the loss of

which threatened the safety of the community—caused emotional and collective community trauma. *Id.*, PageID.79277–78, ¶¶42–46.

Dr. Reicherter was asked to provide expert opinions regarding whether "the corrosive water conditions allegedly caused by Defendants [were] capable of causing harm to Flint residents," by impacting the community's mental health and emotional wellbeing. *Id.*, PageID.79269, ¶2. Dr. Reicherter's opinions are based on: (1) an established definition of community trauma in the field of psychology, *id.*, PageID.79272, ¶20; (2) identified objective criteria for determining its likely presence, *id.*, PageID.79273, ¶¶21–26; and (3) additional studies by both national and local authorities finding that these objective criteria are present in Flint due to the Water Crisis, *id.*, PageID.79277–281, ¶¶42–55. VNA fundamentally understates the evidentiary foundation for Dr. Reicherter's opinions, which include a substantial body of literature, and specifically studies conducted on precisely what is at issue here—namely, the impact of the Flint water crisis on the community's mental health and emotional wellbeing—which provide a factual foundation of evidence addressing both community trauma generally and its specific occurrence in Flint.

a. Dr. Reicherter's well-grounded opinions establish that Flint experienced community trauma as a result of the Water Crisis.

Dr. Reicherter is a world-renowned expert in the field of community trauma. He is a Clinical Professor and Director of the Human Rights in Trauma Mental Health Program at Stanford University School of Medicine's Department of

Psychiatry and Behavioral Sciences. *See* ECF No. 2459-3 (Reicherter Rpt.), PageID.79270.

Dr. Reicherter has worked with traumatized communities for over twenty years, providing administrative and clinical services in trauma mental health both locally and internationally, including creating and directing clinical mental health programs for vulnerable communities. *Id*. He worked with the Haiti Legal/Medical Project providing psychiatric consultation and assessments for vulnerable earthquake survivors. *See id*., PageID.79296. He also worked with the Middle East Legal/Medical Project providing psychiatric consultation and assessments for a multidisciplinary project for resettlement of survivors of the civil war in Syria. *Id*., PageID.79297. He worked in Cambodia with the country's major mental health providers and administrators to produce an expert report for the Extraordinary Cambers in the Courts of Cambodia – the Khmer Rouge Tribunal. *Id*., PageID.79303. He evaluated the community trauma experienced by the Yazidi people in Northern Iraq and worked with United Nations Investigative Team to Promote Accountability for Crimes Committed by Da'esh/ISIL ("UNITAD") to build capacity for mental health treatment for traumatized communities in Baghdad and Northern Iraq. *Id*., PageID.79270–71. He has also done work with the International Criminal Court, providing expert testimony and reporting about the mental health outcomes of war crimes (Central African Republic and Uganda). *Id*.

Based on his extensive experience, Class Plaintiffs retained Dr. Reicherter to provide expert opinions regarding whether "the corrosive water conditions allegedly caused by Defendants [were] capable of causing harm to Flint residents," by impacting the community's mental health and emotional wellbeing. ECF No. 2459-3, PageID.79269.

Dr. Reicherter describes community trauma as the collective experience of psychological trauma shared by a community exposed to overwhelming stressors that threaten the safety of the community. *Id*., PageID.79273, ¶21. He opines that Flint, already a vulnerable community before the Water Crisis based on its low income, high poverty levels and poor health outcomes, was traumatized by the Water Crisis, which threatened the safety of the community by depriving residents of access to safe drinking water—a basic human need. *Id*., PageID.79277–78. Contrary to Defendants' assertions, Dr. Reicherter's opinions are well supported by the studies conducted on this very issue in Flint, which include assessments made by the Agency for Toxic Substance and Disease Registry, a division of the Center for Disease Control (CDC), as well as peer-reviewed studies. Defendants ignore these entirely. For example, Dr. Reicherter cites to one peer-reviewed study conducted in Flint that found the water crisis increased stress, anxiety, and depression among the

city's population.[41] He cites to another that found that following the water crisis, negative quality of life indicators, including depression, anxiety, and stress, were higher in Flint than overall rates of such conditions in Michigan.[42] Yet another study Dr. Reicherter cites found perceptions of poor water quality in Flint predicted symptoms of posttraumatic stress disorder when controlling for socio-demographics.[43] These and other published studies on the Flint water crisis were reviewed by researchers at London's King's College and Harvard's Humanitarian Initiative who concluded that the results of the studies, taken together, "suggest a negative psychological effect caused by the water crisis, including anxiety and health worries, exacerbated by lowered trust in public health officials, uncertainty about the long-term impacts of the crisis, financial hardships, stigma, and difficulties seeking help."[44] Thus, Dr. Reicherter's opinions are based on an extensive body of

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[41] ECF No. 2459-3 (Reicherter Rpt.), PageID.79278, ¶ 47 (citing C.A. Cuthbertson et al., *Angry, Scared, and Unsure: Mental Health Consequences of Contaminated Water in Flint, Michigan,* 93 J. Urban Health 899 (2016)).

[42] ECF No. 2459-3 (Reicherter Rpt.), PageID.79283, ¶ 59 (citing Fortenberry, G.Z. et al., Assessment of behavioral health concerns in the community affected by the Flint water crisis – Michigan (USA) 2016., 33 Prehosp. Disaster Med., 256–265 (2018)).

[43] *Id*., PageID.79280, ¶52 (citing D.J. Kruger, et al., Toxic trauma: Household water quality experiences predict posttraumatic stress disorder symptoms during the Flint, Michigan, water crisis, 45 J. of Community Psychology, 957–962 (2017a)).

[44] Ex. 13 (Brooks SK & Patel SS, *Psychological Consequences of the Flint Water Crisis: A Scoping Review*. Disaster Med Public Health Prep (2022)); *see id*., PageID.79272, ¶16 (citing Brooks & Patel).

research conducted ***in Flint*** on these very issues. Moreover, Dr. Reicherter opines that the increased distress, anxiety, and depression found in Flint following the water crisis is consistent with studies of other traumatized communities. ECF No. 2459-3, PageID.79278–281.

Finally, Dr. Reicherter concludes, based upon the findings of eight peer-reviewed studies conducted in Flint since 2016, that Flint residents still struggle with elevated behavioral issues, increased substance use, anxiety, depression, post-traumatic stress disorder, lowered trust in public health officials, financial hardships, uncertainty about the long-term impact of the water crisis, and stigma. *Id*., PageID.79283, ¶ 59.[45] For example, one study estimated that in 2019, 29% of Flint residents met criteria for PTSD and 26.3% for depression. *Id.* (citing *Ezell*, *supra*).

[45] Citing Fortenberry, *supra*; Heard-Garris et al., *Voices from Flint: Community perceptions of the Flint water crisis*, 94 J. Urb. Health, 776–779 (2017); Kruger, D.J., *Facultative adjustments in future planning tendencies: Insights on life history plasticity from the Flint water crisis*, 4 Evolutionary Psych. Sci., 372–383 (2018); S. Gray et al., *Identifying the causes, consequences, and solutions to the Flint water crisis through collaborative modeling*, 10 Env't Just., 154–161 (2017); A. Singer et al., *Translating community narratives into semi-quantitative models to understand the dynamics of socio-environmental crises*, 97 Env't Modelling Software, 46–55 (2017); R.S. Sneed et al., *Behavioral health concerns during the Flint water crisis, 2016-2018*, 14 Comm. Mental Health J. (2020); V. Morckel & K. Terzano, *Legacy city residents' lack of trust in their governments: An examination of Flint, Michigan residents' trust at the height of the water crisis*. 41 J. Urb. Affs., 585–601 (2019); JM Ezell & EC Chase, *A Population-Based Assessment of Physical Symptoms and Mental Health Outcomes Among Adults Following the Flint Water Crisis*, 98 J. Urb. Health, 642–653 (2021).

From his review and analysis of these studies, as well as peer-reviewed studies conducted of other traumatized communities, Dr. Reicherter concludes that the rates of symptoms of mental health disorders in the Flint community, including symptoms of posttraumatic stress disorder, post-traumatic embitterment, anxiety, and depression, are likely to continue increasing due to both delayed onset and intergenerational transmission, whereby impairment in functioning of parents contributes to the transmission or exacerbation of symptoms in children. *Id*., PageID.79291–92.

VNA completely ignores the basis for Dr. Reicherter's opinions regarding community trauma found in the voluminous mental health research conducted in Flint and elsewhere. VNA's motion should be denied.

b. Dr. Reicherter's opinions are relevant to the issues trial.

VNA wisely does not challenge Dr. Reicherter's qualifications to provide the foregoing opinions. It does, however, argue that Dr. Reicherter's opinions are not relevant to the issues trial. VNA is wrong.

VNA contends that Dr. Reicherter's opinions regarding community trauma "do not bear on whether the contaminated water was capable of causing ***particular individuals*** to experience adverse mental-health outcomes." ECF No. 2459, PageID.79254 (emphasis added). But that issue is not one of the five issues the Court has certified for trial. Rather, as relevant here, the Court certified the following:

"Were the contaminated water conditions capable of causing harm ***to Flint residents*** . . . ?", ECF No. 2250, PageID.73963.

Dr. Reicherter's opinion that Flint was traumatized by the Water Crisis and that the manifestation of community trauma is a "higher prevalence of mental health disorders" within a community is relevant to this certified question because it demonstrates that the contaminated water conditions were in fact capable of causing harm to Flint residents' mental health and emotional wellbeing. ECF No. 2459-3, PageID.79269, 79273, 79277–78.

Dr. Reicherter's opinions on community trauma are thus highly relevant to the issues trial.

c. Dr. Reicherter's expert opinions are based upon reliable methodologies and sufficient data.

None of the VNA Defendants' challenges to the reliability of Dr. Reicherter's methodologies and the sufficiency of the data he relied upon in formulating his opinions have merit, and accordingly the Court should reject them.

i. Dr. Reicherter reliably identifies community trauma in Flint.

VNA first argues that Dr. Reicherter provides no reliable method for identifying trauma in communities. *See* ECF No. 2459, PageID.79255–59 ("Dr. Reicherter does not apply a reliable method for determining whether a community has experienced trauma."). VNA is incorrect.

Dr. Reicherter begins his analysis with the widely accepted definition of "community trauma" as a "collective experience of psychological trauma shared by a community exposed to overwhelming stressors that threaten the safety of the community." ECF No. 2459-3, PageID.79273, ¶21 (citing Roberts, Reicherter, *et al., Partnerships for Mental Health: Narratives of Community and Academic Collaboration* (2015)). He then provides extensive discussions on the methodology for identifying the presence of community trauma.

Dr. Reicherter identifies the precipitant of "traumatic experiences that may affect whole communities[,]" which "include community violence, natural disaster, and armed conflict; and certainly include situations wherein communities are at risk [of] not receiving basic needs like water." ECF No. 2459-3, PageID.79273, ¶22 (citing National Center for PTSD (2015); Trauma and Violence (2017)). He also identifies the manifestation of community trauma in a "higher prevalence of mental health disorders" within a community. *Id.*, ¶24 (citing Am. Psych. Ass'n (2015); Roberts, Reicherter, *et al.* (2015; Trauma and Violence (2017)).

VNA does not take issue with Dr. Reicherter's assessment of community trauma. Instead, it contends that his application of this assessment to Flint is unreliable because it is based in part upon findings by the Center for Disease Control (CDC) in its *Community Assessment for Public Health Emergency Response (CASPER) After the Flint Water Crisis* (July 2016), which VNA claims, without

basis, is "inherently unreliable" because it utilized self-reported responses. *See* ECF No. 2459, PageID.79257. VNA contends that "[c]ourts often exclude expert opinions that rely on self-reported data because the data are unreliable." *Id.* This assertion is off base for multiple reasons.

First, Dr. Reicherter's reliance on the CDC's CASPER survey is not only appropriate, but best practice in the field. The CASPER survey is a recognized epidemiologic tool designed by the CDC to "provide public health leaders and emergency managers with household-based information about a community. It is quick, reliable, relatively inexpensive, and flexible."[46]

Second, use of self-reported data is well-founded, practical, and customary in the field of psychiatry. *Johnson v. Williams*, 2017 WL 11318160, at *9, n. 10 (E.D. Mich. Aug. 7, 2017) ("[I]t is difficult to imagine how a psychiatric diagnosis could take place if a psychiatrist were not permitted to rely on a patient's self-reports..." (quoting *Williams v. Brown*, 244 F.Supp.2d 965, 967 (N.D. Ill. 2003)). Indeed, the study VNA erroneously cites in support of its argument that self-reporting is "inherently unreliable" says nothing of the sort. *See* ECF No. 2459, PageID.79257 (citing S. Donaldson & E. Grant-Vallone, *Understanding Self-Report Bias in*

[46] United States Centers for Disease Control and Prevention, The Community Assessment for Public Health Emergency Response (CASPER), *available at* https://www.cdc.gov/nceh/casper/default.htm#:~:text=the%20Community%20Assessment%20for%20Public,%2C%20relatively%20inexpensive%2C%20and%20flexible.

Organizational Behavior Research, 17 J. Bus. Psych. 245, 245–260 (2002)). The referenced paper dealt exclusively with organization and employee research in employment settings, and thus has no bearing at all on the CDC CASPER study conducted in Flint. That notwithstanding, the study actually suggests that even in that context, "one should not automatically assume that self-reports are the inferior source of data in workplace research." 17 J. Bus. Psych. at 257.

As VNA correctly notes, "[f]or an expert's methodology to be reliable, the expert must use 'those kinds of facts or data on which experts in the field would reasonably rely.'" ECF No. 2459, PageID.79258 (quoting *Gopalratnam v. Hewlett-Packard Co.,* 877 F.3d 771, 781 (7th Cir. 2017) (internal quotation marks omitted)). This is precisely what Dr. Reicherter has done.

Third, courts do not routinely exclude expert testimony simply because the testimony relies in part on self-reported data, as evidenced by *Johnson v. Williams*, *supra*, a case cited in VNA's own motion. *See* ECF No. 2459, PageID.79257 at n.3. In *Johnson,* a minor committed suicide while in the custody of defendant-child care organization. Decedent's mother filed claims on behalf of herself and her surviving minor child. Plaintiffs retained a psychologist to opine on the impact of decedent's death on the mental health of his surviving sibling. Defendant moved to strike the expert, claiming that "the entire basis" for his opinions was "a self-reported lay opinion from [decedent's] mother that whatever pre-existing mental health problems

[the surviving sibling] had were in some way exacerbated by the death of [decedent]." *Id.*, 2017 WL 11318160, at *8. The Court ***denied*** defendant's motion on this point finding that:

> While such parroting, with nothing more, would clearly not satisfy *Daubert* . . . medical professionals reasonably may be expected to rely on self-reported patient histories. Such histories provide information upon which physicians may, and at times must, rely in their diagnostic work . . . . Indeed, it is difficult to imagine how a psychiatric diagnosis could take place if a psychiatrist were not permitted to rely on a patient's self-reports . . .

Id. at n.9 (citing *Walker v. Soo Line R.R. Co.*, 208 F.3d 581, 586 (7th Cir.), *cert. denied*, 531 U.S. 930 (2000); *Williams v. Brown*, 244 F.Supp.2d 965, 967 (N.D. Ill. 2003) (internal citation omitted); *see also Jama v. Esmor Corr. Servs., Inc.*, 2007 WL 1847385, at *17 (D.N.J. June 25, 2007) (rejecting defendant's arguments that plaintiffs' psychologist's reports were "unreliable because they [we]re excessively dependent on self-reports of Plaintiffs as to the cause of their psychological conditions" and holding that plaintiffs' expert's reliance on the self-reported information was appropriate under the circumstances); *Decker v. GE Healthcare, Inc.*, 770 F.3d 378, 385 (6th Cir. 2014) (adverse event reports ("AERs") are "reports sent to drug companies that inform the company that a patient experienced a harmful event after taking the company's drug"); *id.* at 394 (district court did not abuse discretion in concluding that expert "was qualified to reliably testify as to the significance of the AERs" as a safety signal); *see also Drake v. Allergan, Inc.*, 111

F. Supp. 3d 562, 569–570 (D. Vt. 2015) ("While caution may be advised when attributing causation solely on the basis of [adverse event] reports, the jury could properly consider them to be a relevant factor.").

The two remaining cases VNA relies on to support this contention are irrelevant to the instant case, as both involved physicians whose opinions were not derived from scientifically valid principles within their fields. *See* ECF No. 2459, PageID.79257 at n.3 (citing *Madej v. Maiden*, 951 F.3d 364 (6th Cir. 2020); *Guthrie v. Ball*, No. 11-cv-333, 2014 WL 11581410 (E.D. Tenn. Oct. 10, 2014)).[47] By contrast, here Dr. Reicherter's opinions are derived from scientifically valid principles within his field, namely: (1) an established definition of community trauma in the field of psychology, ECF No. 2459-3, PageID.79272, ¶20; (2) identified objective criteria for determining its likely presence, *id.*, ¶¶ 21–26; and (3) additional studies by both national and local authorities finding that these objective criteria are present in Flint due to the Water Crisis, *id.*, PageID.79277–281, ¶¶42–55. Additionally, and significantly, the CASPER study is designed to test

[47] *Madej*, 951 F.3d at 374–76 (Excluding plaintiff's treating physician's "chemical sensitivity" diagnosis as unreliable where physician failed to conduct any objective analysis and based his conclusions entirely on plaintiff's statements. Plaintiff "identif[ied] nothing suggesting that the relevant scientific community would accept this subjective method of proving causation in their professional work. So they failed to show that the methodology underlying [the physician's] testimony [wa]s scientifically valid.") (internal citations omitted); *Guthrie*, 2014 WL 11581410, at *17 (Plaintiff's "self-reporting to Dr. Ball that he had a history of asthma is not a sufficient basis for expert testimony that [plaintiff] in fact suffered from asthma.").

for exactly what Dr. Reicherter is opining about, namely the impact of the crisis on the mental health of the community.[48]

Dr. Reicherter thus permissibly relied upon the CDC's study, among others, as support for finding that Flint residents are experiencing higher prevalence of mental health disorders resulting from the Flint Water Crisis. [49] Dr. Reicherter's opinions on the City of Flint as a traumatized community are based on reliable science and data and thus are admissible.

ii. Dr. Reicherter appropriately considered conditions in Flint to opine on causation of community trauma from the Water Crisis.

VNA next argues that Dr. Reicherter provides no reliable basis for concluding that the Flint Water Crisis caused the community trauma in the City of Flint. This argument, too, is incorrect and should be rejected for several reasons.

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[48] It is significant to note that the follow-up CASPER studies conducted several years after the initial study confirmed the initial results. *See* ECF No. 2459-3, PageID.79285–87 ("Flint residents still gravely struggle with common mental health disorders such as depression and anxiety and other manifestations of emotional distress . . . .").

[49] VNA argues that Dr. Reicherter impermissibly compares "apples-to-oranges" by comparing data obtained from CASPER and other studies conducted in Flint to the national prevalence rates of mental-health disorders reported by the American Psychiatric Association ("APA"). *See* ECF No. 2459, PageID.79258. Without any support whatsoever, VNA contends that these data sets cannot be compared because the APA data "reflect[s] diagnoses by mental-health professionals" while the data obtained from CASPER and other studies are based upon self-reported symptoms. *Id*. But VNA omits the fact that the national prevalence rates of mental-health disorders as reported by the APA are *also* based upon self-reports from individuals across the country.

Dr. Reicherter opines generally that an event that threatens the actual or perceived safety of a community causes increased risk of poor psychological outcomes for persons across the community, ECF No. 2459-3, PageID.79273, and specifically that this is exactly what has occurred in Flint because of the Water Crisis. *Id.*, ¶¶ 44–55. VNA does not dispute that the Flint Water Crisis is an event that threatens the actual or perceived safety of the Flint community.

Instead, VNA criticizes Dr. Reicherter for purportedly having insufficient knowledge of the Water Crisis's timeline. *See* ECF No. 2459, PageID.79259 ("He could not say when it began, when it ended, or what caused it."). These criticisms are both exaggerated, *see, e.g.*, ECF No. 2459-3, PageID.79277 ("[a]pproximately 100,000 residents in Flint were exposed to a contaminated water supply containing high levels of lead as well as other dangerous pathogens between 2014 and 2015...") and irrelevant to his opinion that the event, "a poisoned water supply, lack of access to safe drinking water, and the threat of continued loss of this basic need is a threat to survival expected to create community trauma," *id.*, PageID.79278. VNA does not and cannot dispute this.

VNA also argues that Dr. Reicherter's recognition of Flint's social problems predating the Water Crisis "undermine[s] his opinion about causation." ECF No. 2459, PageID.79259. It does not. To the contrary, Dr. Reicherter, throughout his report, accounts for the possibility and even likelihood that trauma-inducing events

will occur in already-vulnerable communities ***and thereby compound pre-existing conditions***. *See* ECF No. 2459-3, PageID.79273 ("When vulnerable, traumatized communities are exposed to new traumatic stressor[s], the mental health of the community as a whole will be adversely affected . . . ."); *id.*, PageID.79277 ("Flint was considered a vulnerable community prior to the water crisis, thus increasing the damage likely to result from additional trauma."); *see also id.*, PageID.79276–77 (describing pre-existing vulnerabilities). In what has become a familiar pattern, VNA's supposed basis for exclusion is in fact a point for cross-examination.

Fundamentally, VNA largely ignores, and significantly understates the evidentiary foundation for Dr. Reicherter's opinions. These opinions are based on: (1) an established definition of community trauma in the field of psychology, ECF No. 2459-3, PageID.79272; (2) identified objective criteria for determining its likely presence, *id*., PageID.79273–74; and (3) additional studies by both national and local authorities finding that these objective criteria are present in Flint due to the Water Crisis, *id*., PageID.79277–281. Dr. Reicherter's opinions have a substantial factual foundation in studies conducted in Flint specifically on the very issue he is opining about, in addition to other evidence addressing both community trauma generally and its specific occurrence in Flint.

Dr. Reicherter's opinion that the Flint Water Crisis caused community trauma is likewise reliable and should be held admissible.

8. Dr. David Keiser

Dr. David Keiser is an economist and tenured full professor at the University of Massachusetts Amherst. He is the author of more than fifteen peer-reviewed publications on the economic impacts of environmental quality and policy, and his expertise is on the economics of surface and drinking water quality. He is the co-author of a peer-reviewed academic paper published in 2023 in the American Economic Journal: Economic Policy, titled "Economic Effects of Environmental Crises: Evidence from Flint, Michigan." This paper serves as the foundation for Dr. Keiser's opinions in this litigation, which focus on: (1) explaining how to construct an economic model to determine whether residential-property owners in Flint suffered losses, if any, caused by the Flint Water Crisis, and (2) using that model to quantify the harm those property owners suffered, if any, caused by the Flint Water Crisis.

Dr. Keiser employed a well-known statistical technique known as "difference-in-differences" to estimate the causal effect of the contaminated water conditions on Flint property prices. *See* ECF No. 2458-3 (Keiser Supp. Rpt.), PageID.79060. His "difference-in-differences" model operates by constructing a control group of cities to compare to Flint to then observe to what extent, if any, housing prices in Flint diverged from those in the control group following the switch to Flint River water. After employing his methodology, Dr. Keiser concludes that "the water

contamination events in Flint were capable of causing harm to Flint property owners and residents" because there were statistically significant decreases in Flint property values as compared to the property values of his control group of cities. Ex. 14 (Keiser Rebuttal Rpt.) at 1.

Dr. Keiser completed his original working draft of his published academic paper and had submitted it for publication long before Class Counsel contacted him for this litigation. As part of his independent assessment of whether the contaminated water conditions in Flint could have caused harm to Flint property owners, Dr. Keiser calculated the magnitude of any loss—as necessary to provide context to the analysis.

Perhaps recognizing that Dr. Keiser's paper has been published in a leading, peer-reviewed academic journal, ***Defendants do not challenge the validity of any aspect of his methodology***.[50] Instead, Defendants move to exclude only one aspect of Dr. Keiser's opinions from the upcoming issues trial: what Defendants incorrectly characterize as Dr. Keiser's "damages estimates" that Flint experienced a "decline in home prices of 38.5% since the switch [to Flint River water]," that "average Flint

[50] Accordingly, Class Plaintiffs' response does not wade into an analysis of Dr. Keiser's methodology, and instead focuses solely on the two limited arguments VNA makes in its motion. For a full explanation of Dr. Keiser's methodology, please see Class Plaintiff's opposition to VNA's motion to exclude Dr. Keiser's opinions in support of class certification, which the Court denied without prejudice. *See* ECF No. 1517, PageID.58418–22.

home prices declined by $29,412," and his estimate of "total housing market losses of $559 million" which represents approximately "a 27% to 29% loss in the aggregate value of occupied housing units in the city." ECF No. 2458, PageID.79044.

Defendants misunderstand the role these opinions play in Dr. Keiser's analysis, and incorrectly frames them only as "damages estimates." These opinions are relevant to the issue of causation, and help the jury understand the methodology Dr. Keiser employed to arrive at his conclusion that the contaminated water in Flint could harm Flint property owners. To determine the effect of the FWC on property owners, Dr. Keiser's "difference-in-differences" model compared Flint home prices to those of control cities that had a similar trend in home prices before the FWC. The fact that home prices between Flint and the control cities ***diverged*** after the water switch (and the ***magnitude*** of those differences) is relevant to his explanations for why the contaminated water could harm Flint property owners (and indeed did cause harm). Without such context, the jury is left without a complete understanding of how the Flint housing market progressed before, during, and after the FWC, and how it was impacted in such a way that resulted in marked declines in housing value when compared to similar cities nationwide—context that is necessary to understand how and why Dr. Keiser can opine that the water conditions were capable of harming property values.

Defendants misunderstand the role that Dr. Keiser's analysis plays. Their arguments are premature and meritless, and their motion should be denied.

a. Defendants' motion is premature and improperly brought as a *Daubert* motion.

Defendants' motion is not a proper *Daubert* challenge. Defendants do not argue that Dr. Keiser's opinions or methodology are unreliable. [51] Defendants do not challenge Dr. Keiser's selection of control cities, data quality, methodology provenance, or any other aspect of his report other than the opinions related to the magnitude of the loss suffered by Flint property owners. Nor could they, as Dr. Keiser's opinions have been published in a leading, peer-reviewed academic journal. *See United States v. Gissantaner*, 990 F.3d 457, 464–65 (6th Cir. 2021) (noting how "[p]ublication itself is noteworthy in scientific scholarship—and ultimately why publication in a peer-reviewed journal alone typically satisfies [the] *Daubert* inquiry"); *Daubert*, 509 U.S. at 593 ("[S]ubmission to the scrutiny of the scientific community is a component of 'good science,' in part because it increases the likelihood that substantive flaws in methodology will be detected.").

[51] Indeed, at his deposition, VNA's rebuttal expert to Dr. Keiser, Dr. Christian Redfearn, acknowledged that if he were to answer of the question of how to determine whether the contaminated water conditions in Flint were capable of causing harm to Flint property owners, he "would start with hedonic regression"—in other words, perform an economic model nearly identical to the one Dr. Keiser performed. *See* Ex. 15 (Redfearn Tr.) at 108:14–15; *see id*. at 103:19–108:15.

Thus, as an initial matter, Defendants' motion should be denied as premature because it does not actually raise a *Daubert* challenge at all. *Daubert*'s primary goal is to guard against "misleading 'junk science,'" which VNA acknowledges Dr. Keiser's published academic paper is not. *Best*, 563 F.3d at 177. All of VNA's arguments instead relate to the relevance or potential prejudice of certain aspects of Dr. Keiser's conclusions. *See Rhinehart v. Scutt*, 2017 WL 1395887, at *4 (E.D. Mich. Apr. 19, 2017) (denying motion to exclude because "the Court is currently tasked with evaluating [an expert's] methods, not his conclusions"). The Court does not need to make these evaluations until later in this litigation. *See VBS Distribution, Inc. v. Nutrivita Labs., Inc.*, 2018 WL 9946319, at *4 (C.D. Cal. May 7, 2018) (denying "*Daubert*" motion as "premature and more appropriately addressed on a motion *in limine* closer to trial"); *Caterpillar Fin. Servs. Corp. v. FirstMerit Corp., N.A.*, 2008 WL 824302, at *1 (N.D. Ohio Mar. 24, 2008) (denying motion to exclude expert report because "the Court finds that the motion is premature and would be better addressed as a motion *in limine* when and if Mr. Clark is called to offer actual testimony in this case").

Defendants' motion to exclude certain opinions from Dr. Keiser is premature and can be denied on that basis alone.

b. Defendants mischaracterize Dr. Keiser's opinions regarding the magnitude of loss suffered by Flint property owners as irrelevant.

More critically, Defendants mischaracterizes Dr. Keiser's opinions on the magnitude of the loss suffered by Flint property owners as simply a top-line, class-wide "damages estimate" to frame them as irrelevant to the issues trial. ECF No. 2458, PageID.79046. Defendants dedicate no more than a few sentences to attacking this strawman, claiming that such opinions would not help the trier of fact given the questions certified.

But Defendants misunderstand the role of these opinions in Dr. Keiser's analysis. Dr. Keiser's comparative estimates help the jury understand and contextualize his testimony. Earlie in this litigation, Dr. Keiser developed a rigorous methodology to determine the full causal effect of the Flint Water Crisis on home prices. That methodology involved comparing Flint's home prices to the home prices of a control group of cities he carefully selected based on factors like income, population, racial composition, share of vacant homes, and unemployment rate, and which showed no statistical divergence in home prices with Flint before the water switch. Yet, after the water switch, home prices in Flint experienced a significant decline when compared to the control group. The ***magnitude of that decline*** is helpful to a jury to contextualize the effects of the Flint Water Crisis on the city. Without that context (e.g., that the average home price in Flint declined between

27% to 39% or ~$29,412), jury members have less information on the definitiveness of the harm suffered by Flint property owners, making Class Plaintiffs' argument that the water was capable of harming property values harder to credit. Examining the change in Flint's home prices as compared to the control group of cities—employing a "difference-in-differences" model—is how Dr. Keiser arrived at his conclusion that the Flint Water Crisis was capable of harming (and did indeed, harm) Flint property owners, and it provides helpful background on the housing market in Flint before the water switch. A jury's evaluation of Dr. Keiser's ultimate conclusions could potentially be affected by the ***change*** in home prices he determined: a 1% decline in prices is different from a 25% decline, which is different from an 80% decline. The specific magnitude of the change is relevant to the jury's evaluation of whether the water itself was likely capable of causing harm.

Defendants are free to cross-examine Dr. Keiser about these estimates on the stand and have retained a rebuttal expert specifically for this purpose. *See* ECF No. 1370-27, PageID.47056 (VNA rebuttal expert Dr. Christian Redfearn claiming that Dr. Keiser's "estimated loss is implausibly large," not that no loss occurred). There is no support for Defendants' specious claim that the opinions they seek to excise are irrelevant to the issues trial. Dr. Keiser's estimates are not simply numbers conjured in the abstract, but help the jury ground its understanding of how exactly the Flint Water Crisis was capable of harming Flint properties.

c. Any risk of prejudice does not outweigh the helpfulness of Dr. Keiser's estimates for the jury.

"Rule 403 favors admission and establishes a high bar for exclusion." *United States v. Hofstetter*, 2019 WL 6884981, at *2 (E.D. Tenn. Dec. 17, 2019) (citing *United States v. Lang*, 717 F. App'x 523, 538 (6th Cir. 2006)); *United States v. Asher*, 910 F.3d 854, 860 (6th Cir. 2018) (FRE 403 "test is strongly weighted toward admission"). Evidence is excludable under FRE 403 only if it ***substantially*** outweighs any relevance.

Defendants' motion provides sparse detail as to which aspects of Dr. Keiser's magnitude-of-loss opinions are so unfairly prejudicial or cumulative as to substantially outweigh its relevance. Defendants claim that these opinions "are based on a number of problematic assumptions that [Defendants] would be obliged to refute," and further complain that having to explain how Dr. Keiser came up with his numbers "would take a significant amount of time." ECF No. 2458, PageID.79047–48. Defendants cite no caselaw in support of any of these arguments, and their decision not to challenge the reliability of Dr. Keiser's opinions indicates there are no "problematic assumptions" in his opinions worthy of any *Daubert* challenge. *See Gissantaner*, 990 F.3d at 464–65. Moreover, Defendants never explain why Dr. Keiser describing the methodology he employed to arrive at his conclusion that the Flint Water Crisis could harm (and did harm) Flint property owners would take a burdensome amount of time. All experts at trial will need to lay

a proper foundation, and so Dr. Keiser will need to explain his methodology. Defendants make no colorable argument for why presenting the opinions it wishes to exclude would be an undue waste of time. *See* Wright & Miller, 22A Fed. Prac. & Proc. Evid. § 5219 (2d ed.) ("Courts seldom rely on 'waste of time' as the sole ground for exclusion").

Next, Defendants argue that Dr. Keiser's estimates would be unfairly prejudicial because "it is unnecessary and prejudicial to throw around such large numbers, especially when they are based on such controversial assumptions." ECF No. 2458, PageID.79049. Again, Defendants cite no sources in support of this argument. Class Plaintiffs have shown how Dr. Keiser's opinions contextualize for the jury his methodology and analysis. Defendants provide no basis to believe any potential prejudice from Dr. Keiser's opinions exists at all, let alone ***substantially outweigh*** the helpfulness of these opinions to assist the jury in understanding how Dr. Keiser arrived at his conclusion that the water was capable of harming property values in Flint.

Defendants' motion to exclude certain opinions from Dr. Keiser should be denied. The motion is premature and meritless, and Defendants makes no more than broad sweeping arguments unsupported by case law.

9. Dr. Robert Simons

Professor Robert Simons is the Department Chair of Urban Studies at Cleveland State University and the author or co-author of over 70 peer-reviewed publications on urban development and finance. *See* ECF No. 1208-95, PageID.36165–170. His analysis proceeds in a manner standard for economists who seek to answer a particular question—in this case, whether the FWC had any economic impact on Flint businesses and the extent of any such impact. He employed a combination of generally accepted economic methodologies, tailored to the availability of granular data[52] and the specifics of this case, to identify specific retail and consumer-oriented business subsectors that may have suffered economic declines during the class period due to the FWC (as opposed to general declines associated with macroeconomic conditions). He then evaluated gross receipts data of those identified subsectors to determine whether certain Flint businesses suffered any actual losses. He ultimately concludes that "the contaminated water conditions in Flint were not only capable of causing harm to Flint businesses, but in fact did cause such harm." ECF No. 2462-5, PageID.80338.

[52] As Dr. Simons noted in each of his reports, he was informed on several occasions by the State of Michigan that annual gross receipts data, either at the individual enterprise level or identified by economic subsector, was not available. The unavailability of such direct gross receipts data from the State of Michigan required Dr. Simons to use gross receipts data available from Reference USA. *See, e.g.*, ECF No. 1208-95, PageID.36138; ECF No. 2462-4, PageID.80314.

Defendants' motion argues that: (1) Dr. Simons' opinions quantifying business losses is irrelevant to the issues trial; (2) his quantitative opinions are unreliable; and (3) his economic theories about how contaminated water harmed Flint businesses are unreliable. All of Defendants' arguments are meritless and rest on fundamental misunderstandings or intentional misinterpretations of his opinions. For instance, Defendants consistently misrepresent how Dr. Simons uses the Saginaw and Grand Rapids Metropolitan Statistical Areas ("MSAs") in his analysis (incorrectly calling them "control groups"); and further argues that his use of gross receipts data from Reference USA—a well-respected and well-known supplier of economic data—is cherry-picked and results oriented. Not only are these supposed criticisms inaccurate, but they fundamentally go to the ***weight*** of Dr. Simons' opinions, not their admissibility.

Indeed, throughout their motion, Defendants frequently cite the opinion of VNA's rebuttal expert, Dr. Robert Edelstein (and even attach one of Dr. Edelstein's reports as an exhibit). *See* ECF No. 2462, PageID.80218, 80224–25. As has now become familiar, Defendants' motion is no more than a "battle of the experts" that should be dealt with during cross examination at trial, not at the *Daubert* stage. *See Phillips*, 400 F.3d at 399; *supra* § II(E). Defendants also incorrectly cite inapposite "controlling authorities" that are not relevant at all to the issues at hand. For instance, they cite to *Cannon v. BP Prods. N. Am., Inc.*, 2013 WL 5514284, at *6–*14 (S.D.

Tex. Sept. 30, 2013) as a purported "controlling authority," when that case involved a different methodology regarding different causation issues. Defendants no more than make a cursory reference to the case, without further analysis.[53] Much of Defendants' other arguments follow this pattern of misrepresenting Dr. Simons' opinions.

a. Dr. Simons used a reliable methodology.

Initial and Supplemental Reports. Dr. Simons submitted his initial report on June 29, 2020 in support of certification of a subclass of Flint business owners who suffered losses attributable to the contaminated water conditions in Flint. ECF No. 1208-95 (Simons Opening Rpt.). Dr. Simons' initial report examines whether "changes in consumer spending" due to the FWC could be determined and whether, if yes, any losses to businesses in Flint could be calculated classwide. *Id*., PageID.36136.

[53] *Cannon* is inapposite for several reasons. First, the harm in *Cannon* consisted of elevated emissions levels—which *was also* elevated in the control areas studied. *Id.* at *7. Here, *only* Flint businesses received Flint City water, and Defendants give no indication or evidence that the comparators Dr. Simons used (Saginaw, Grand Rapids, the rest of Genesee County) had similarly corrosive water. Second, one indicator of reliability (though by no means a requirement for admissibility) is for an expert's methodology to be published in a peer-reviewed journal. ***After*** the *Cannon* decision, the peer-reviewed Journal of Real Estate Research accepted and published the same methodology Dr. Simons used in *Cannon*. *See Gissantaner*, 990 F.3d at 464–65.

From the outset, Dr. Simons' analysis was geared toward determining if "certain types of businesses" in Flint would have suffered losses. *Id*. Standard economic theory suggests that not all categories of businesses are equally affected by economic trends. For example, when there are periods of economic contraction, necessities are less affected than luxury goods, which experience the largest spending declines. *Id*., PageID.36137. Not ***all*** businesses in Flint would have been expected to have suffered losses attributable to the FWC, so simply examining all Flint businesses in the aggregate would not reveal whether economic contraction, in fact, occurred for specific subsectors. Dr. Simons thus used a four-step filtering methodology to identify commercial subsectors that may have been impacted by any economic decline from the FWC. *Id*., PageID.36141–43.

First, he uses annual data from the state of Michigan to identify retail or consumer-oriented business subsectors that had experienced losses during previous periods of economic contraction to establish a baseline universe of retail or consumer-oriented subsectors that could be predicted to experience losses from another contraction. He identified 23 such subsectors. *Id*., PageID.36141. ***Second***, he compared annual wage growth trends in the Flint MSA for the 23 subsectors with corresponding data for the Grand Rapids and Saginaw MSAs to identify subsectors where total wage trends in Flint did not match the other MSAs, finding this to be true for 11 business subsectors. This step allowed him to identify not just business

subsectors that may have experienced changes generally (potentially due to more macro-economic factors) but allowed him to also identify subsectors that suffered relative to the performance of those same subsectors in comparator areas that did not experience contaminated water. ***Third***, he analyzed gross receipts data from Reference USA, a third-party database of firm-specific business information, to identify more granular subsectors from the 11 subsectors identified in Step 2 that experienced declines during the class period. *Id*., PageID.36142–43. ***Fourth***, he further narrowed the universe of affected business subsectors by identifying and eliminating those for which declines were possible, but not clear, including those potentially explained by the 3% decrease in Flint's population over the relevant period, or where the decline was only nominal in comparison to wage decline patterns in the Grand Rapids and Saginaw MSAs. *Id*., PageID.36143.

Having determined the universe of Flint business subsectors that ***may*** have suffered losses caused by contaminated water, Dr. Simons divided the firms within those subsectors into two categories: surviving firms and failed firms (those that went out of business during the class period). For surviving firms, he calculated any losses suffered from potential lost profits. For failed firms, he calculated both lost profits and business interruption damages resultant from their closure (*e.g.*, lost investor equity, ruined credit). These calculations indicated that Flint businesses did, indeed, suffer harm due to the contaminated water conditions. *Id*., PageID.36150.

On October 2, 2020, Dr. Simons submitted a supplemental report that included opinions regarding losses incurred by restaurants in Flint, which had not been included as part of his initial report. ECF No. 2462-4. He used data from Reference USA to compare the performance of restaurants in Flint to those in the remainder of Genesee County for the years from 2014 to 2018, finding a statistically significant increase in business failures for Flint during this period. *Id*., PageID.52239. He calculated the magnitude of business losses according to the same methodology as set forth in his initial report. *Id*., PageID.80309–11.

Rebuttal Report. Dr. Simons executed a rebuttal report on March 1, 2023 responding to several alleged criticisms from VNA's rebuttal expert, Dr. Edelstein. *See* ECF No. 2462-5. In particular, his Rebuttal Report offers four models of calculating the impact of the FWC on Flint businesses which respond directly to specific alleged criticisms levied by Dr. Edelstein:

- In Model A, Dr. Simons employs the same methodology and assumptions, but applies a discount factor (based on statistical significance of the Flint-versus-Genesee County comparisons) that renders his loss calculations even more conservative. *Id*., PageID.80334–35.
- In Model B, Dr. Simons replaces the statewide expected survival rate with the Genesee County survival rates outside of Flint for restaurants and for other business subsectors, respectively, to account for Dr. Edelstein's allegation that

it is inappropriate to calculate damages based on a statewide expected business survival rate. *Id.*, PageID.80335.

- In Model C, Dr. Simons removes from his Model B calculations any losses associated with subsectors for which the corresponding significance test "Z statistic" was negative, while retaining subsectors where the Z statistic was positive but not individually statistically significant (primarily due to small sample size) based on significance of the aggregate statistical differences across all subsectors. In so doing, he addresses Dr. Edelstein's criticism that he has purportedly allocated losses to business subsectors that, as a group, outperformed those in Genesee County. *Id.*
- In Model D, Dr. Simons adjusts his Model B to reflect reclassification of firms as either "surviving" and "failed" businesses based upon Dr. Edelstein's analysis of businesses originally reported as "failed" in Dr. Simons' initial report, unless Dr. Simons located additional evidence of closure. *Id.*, PageID.80335–80336.

What is relevant is that Dr. Simons endeavored to respond to specific critiques raised by Dr. Edelstein, but each of his models in response ***still showed*** that certain Flint businesses suffered losses due to the water contamination (ranging from ~$5.276 million to ~$27.245 million). *Id.*, PageID.80335–80338. Dr. Simons states that "[t]he primary conclusion to be drawn from the comparison of these damage

models is that even when Defendants' objections are accommodated, there remains evidence of ***substantial unexplained excess business closures in Flint after the water crisis*** (a notion similar to the "excess deaths" statistic used in the context of the COVID-19 pandemic)." *Id*., PageID.80337 (emphasis added). These excess closures and business losses are thus attributable to the Flint Water Crisis, showing that the contaminated water conditions were capable of harming Flint businesses (and indeed, did harm Flint businesses).

Contrary to Defendants' assertion, Dr. Simons' models and analysis in his Rebuttal Report does not mean that he "changed his theory of how the contaminated water allegedly harmed Flint businesses" ECF No. 2462, PageID.80214. Instead, the models demonstrate more fully that Defendants' criticisms are ***not*** matters of methodology, but rather matters of factual dispute between Dr. Simons and Dr. Edelstein and that Defendants' mainly have issue with Dr. Simons' ***conclusions***. *See, e.g.*, *Rhinehart*, 2017 WL 1395887, at *4.

b. Dr. Simons' opinions about the magnitude of loss suffered by Flint businesses are relevant to the issues trial.

Defendants first argue that what they characterize as Dr. Simons' "quantitative opinions"—opinions seeking to identify and measure the actual revenue losses that Flint businesses suffered are irrelevant or otherwise prejudicial to the issues trial. ECF No. 2462, PageID.80217–80218. Like with their arguments against Dr. Keiser's opinions, Defendants misconstrue the role that opinions about

the magnitude of loss play in Dr. Simons' analysis. Dr. Simons' explanations for why the contaminated water was capable of harming (and did harm) Flint businesses is tied to his estimates.

For instance, each of Dr. Simons' models A through D—which respond directly to Dr. Edelstein's purported criticisms—still showed that Flint businesses suffered losses ranging from between $5 million to over $27 million from the contaminated water. These opinions help the jury understand the nuances of Dr. Simons' methodology, and how—even when accounting for the alleged issues Dr. Edelstein raised—certain Flint businesses still suffered harm. To be clear, the fact that Dr. Simons has provided additional response to Dr. Edelstein's opinions does not mean that any of Dr. Edelstein's criticisms are valid or that Dr. Simons' original estimates of business losses detailed in his initial and supplemental reports are inaccurate or unreliable. Dr. Simons' opinions simply show that regardless of how an economist approaches the issue (and accounting for a myriad of assumptions, like those offered by Dr. Edelstein)—Flint businesses were capable of being harmed by the contaminated water conditions.

It would be unfair to permit Defendants to present supposed criticisms of Dr. Simons without permitting Dr. Simons to provide a fulsome response by precluding testimony about how the magnitude of losses suffered by Flint businesses were affected when accounting for the issues Dr. Edelstein raised. *See Rivera v. United*

States, 2013 WL 12134104, at *2 (W.D. Tex. Sept. 25, 2013) (denying motion to exclude a plaintiff's statistics expert because—if defendants' claims about plaintiffs' expert "cherry picking" data and having a "malleable" methodology were correct—then defendants could arrive at completely different results employing the same methodology, which would be a point for cross examination); *EEOC v. Venator Grp.*, 2002 WL 181711, at *3 (S.D.N.Y. Feb. 5, 2002) (denying motion to exclude expert opinions that "answers . . . criticisms . . . by defendant's experts").

Defendants also argue that Dr. Simons' opinions on the magnitude of loss would "waste time and cause undue delay" such that they should be excluded under Rule 403. Defendants offer no support for this cursory argument, and "wasting time" is not typically a basis for excluding opinions absent another compelling reason. *See* Wright & Miller, 22A Fed. Prac. & Proc. Evid. § 5219 (2d ed.) ("Courts seldom rely on 'waste of time' as the sole ground for exclusion"). Indeed, Defendants' claim that Dr. Simons' opinions should be excluded because they involve "complicated issues of data and economic methodology" demonstrates exactly why they should be permitted. ECF No. 2462, PageID.80218.

c. Dr. Simons' opinions about the magnitude of loss are reliable.

Defendants' motion raises four separate arguments for why Dr. Simons' "quantitative" opinions are supposedly unreliable, each of which is addressed below.

i. Dr. Simons' Use of Grand Rapids, Saginaw, and Genesee County as Comparators is Reliable.

Defendants misunderstand the role comparator areas play in Dr. Simons' methodology. He does not use Saginaw and Grand Rapids as traditional "controls" such that he directly compared Flint's business revenues with those of the other cities to evaluate the differences between them to determine any loss. Rather, he uses Saginaw and Grand Rapids (two nearby metro areas) to identify business subsectors in the Flint MSA that may have suffered loss for further analysis. Dr. Simons compared wage trends for Flint to those for Saginaw and Grand Rapids to identify subsectors for which wage trends did not match. But the extent of losses (if any) businesses suffered due to contaminated water was a wholly separate analysis that did not require further comparison between Flint and those areas, and which remained subject to confirmation through additional analysis. *See* ECF No. 2462-5, PageID.80329. This additional analysis occurred through Dr. Simons' use of a different set of data (Reference USA gross receipts data) and a separate calculation.

Yet, setting aside Defendants' fundamental misunderstanding of how Dr. Simons uses Saginaw and Grand Rapids, those areas are still the most appropriate comparators for his analysis. For purposes of examining effects on ***businesses***, regional proximity is a key component (think Silicon Valley's relationship to technology sectors). *See id*. By considering the Saginaw and Grand Rapids MSAs, Dr. Simons' analysis uses the closest available in-state city comparators in terms of

size and geography, while avoiding areas with clearly incomparable business environments (such as Lansing, for instance, which has a distinct concentration of governmental and educational activity).

Defendants' argument that Dr. Simons' selection of comparators is different from Dr. Keiser's selection of a control group of cities ignores that Drs. Simons and Keiser ***performed different analyses***. Studying any potential impacts on business revenues through changed spending patterns is inherently different from studying potential impacts on housing prices. Dr. Keiser's analysis focuses "on direct consumer behavior related to very specific goods" for which supply tends to be relatively inelastic. *Id.*, PageID.80329; *see also* Ex. 14 (Keiser Rebuttal Rpt.), p.21 (Dr. Keiser noting how standard economic theory treats housing supply as inelastic). In contrast, Dr. Simons' analysis focuses on discretionary consumer spending patterns, which is much more elastic.[54] *See* ECF No. 1208-95, PageID.36140.

Defendants' critiques of Dr. Simons' use of the remainder of Genesee County as a comparator in his October 2020 supplemental report has similar pitfalls. Defendants claim that by using Genesee County as a comparator to evaluate potential substitutionary effects from changed spending habits, Dr. Simons

[54] Defendants mistakenly claim that Dr. Simons "admitted that Grand Rapids and Saginaw are not an appropriate control for Flint." He did not make any such admission. In the portion of Dr. Simons' deposition transcript that Defendants cite, Dr. Simons expressly explains his selection criteria for choosing proper comparators. *See* ECF No. 2462-6, PageID.80350–51.

confounds any potential effects from the FWC being tested because any potential redirected spending is redirected to Genesee County (and thus creates a potential "double counting" problem). However, as Dr. Simons clearly states, the purpose of this analysis is to "elucidate the effect on business revenues, if any, of substitutionary spending pattern changes by residents of both the city of Flint ***and*** the county" and "the theory being tested is that substitutionary spending changes by both city and county residents, combined with changes in available discretionary income for city residents, led to business losses for certain subsectors in Flint." ECF No. 2462-5, PageID.80330 (emphasis added). Reduced spending at restaurants in Flint necessarily means that there are less people from Genesee County also eating at Flint restaurants.

There are other cogent reasons underlying Dr. Simons' use of the remainder of Genesee County as a meaningful comparator. Potential changes in the economic base (e.g., a plant or shift closing, or a new economic development project) are held constant—an essential consideration when trying to account for possible alternative explanations, which would not be the case were the comparator to come from a region outside of Michigan. There is thus a trade-off between the need to hold the economic base constant in a comparison and having some degree of economic crossover between the city and the rest of the county. Defendants' argument also runs counter the realities of the question presented for trial—regardless of if there

are issues with the magnitude of business losses calculated by using the rest of Genesee County as a comparator, that does not detract from Dr. Simons' methodology in identifying that at a minimum, the contaminated water in Flint was capable of harming businesses.

In any event, this purported critique goes to the weight of Dr. Simons' opinions, not its underlying reliability. *See Zarinebaf v. Champion Petfoods USA Inc.*, 2022 WL 910638, at *3 (N.D. Ill. Mar. 29, 2022) (noting that an expert's choice of control group for a study or his choice to "not use a formal control group" at all "goes to the weight to be afford[ed] to the results" and not a methodology's reliability); *Takeguma v. Freedom of Expression LLC*, 2021 WL 487884, at *3 (D. Ariz. Feb. 10, 2021) (an expert's choice of control or "lack of a control group—go to the weight" of evidence, "not admissibility"); *Phoenix Light SF Ltd. v. Bank of N.Y. Mellon*, 2020 WL 1322856, at *10 (S.D.N.Y. Mar. 20, 2020) ("Potential flaws with [an expert's] control group thus go to the weight of his testimony, not its admissibility."); *Mathews v. Novartis Pharms. Corp.*, 2013 WL 5780415, at *18 (S.D. Ohio Oct. 25, 2013) (agreeing that "lack of a control group goes to the weight of the testimony, not to its admissibility").

ii. Dr. Simons' data is reliable.

Next, Defendants claim that Dr. Simons' use of gross receipts[55] data from Reference USA is unreliable. But data from Reference USA is a commonly used and accepted resource for experts who analyze firm-specific business data. *See, e.g.*, Colleen V. Chien, Michael Risch, *Recalibrating Patent Venue*, 77 Md. L. Rev. 47, 81 (2017) (relying on data from Reference USA and describing it as "a widely used database of business locations relied upon by other scholars"); Steven M. Graves & Christopher L. Peterson, *Predatory Lending and the Military: The Law and Geography of "Payday" Loans in Military Towns*, 66 Ohio St. L.J. 653, 742 (2005) (relying on Reference USA data); Colleen V. Chien, *Software Patents As A Currency, Not Tax, on Innovation*, 31 Berkeley Tech. L.J. 1669, 1699 (2016) (same).

Moreover, use of gross receipts data—as Dr. Simons has done to determine the magnitude of loss (if any) suffered by Flint businesses—is commonly accepted by courts nationwide. *See, e.g., Schatzki v. Weiser Cap. Mgmt., LLC*, 2013 WL 6284417, at *2 (S.D.N.Y. Dec. 4, 2013) (rejecting *Daubert* challenge on basis that expert used "gross receipts" because such arguments "go to the weight . . . of the

[55] Gross receipts is the total amount of sales from a business that form the basis for corporate taxation. This information may be available through state governments, and Dr. Simons requested this data from the State of Michigan. However, he was informed that such data was unavailable. Accordingly, Reference USA gross receipts data was the next best available because it also identified the specific commercial subsectors that Dr. Simons analyzed. *See* ECF No. 1208-95, PageID.36141–142.

testimony," not reliability); *cf. FTC v. BlueHippo Funding, LLC*, 762 F. 3d 238, 242 (2d Cir. 2014) (accepting gross receipts data as "an appropriate baseline" for assessing "the actual loss to consumers" as a result of a defendant's behavior); *FTC v. Direct Mktg. Concepts, Inc.*, 624 F.3d 1, 15 (1st Cir. 2010) (gross receipts data were an appropriate measure of damages). Accordingly, use of Reference USA gross receipts data is not a ***methodological*** issue but a question of inputs that go to the weight of Dr. Simons' opinions, not their admissibility.

Defendants additionally argue that, according to Dr. Edelstein's investigation, certain businesses that Reference USA indicates as closed are purportedly still operating. ECF No. 2462, PageID.80225. However, as Dr. Simons explains in his opening report, he (1) confirmed with a business Reference USA representative that in most cases, where data is no longer listed for a firm, it is because that firm has closed and (2) to the extent numbers need to be adjusted to account for instances of error, that is an issue going to the scope of losses, not the underlying methodology or his ultimate conclusion that there were losses attributable to the Flint Water Crisis.[56] Indeed, the fact that Dr. Edelstein used specific U.S. tax return data to

[56] The single case that VNA cites for the proposition that a methodology's input may render an expert's opinions excludable involved a unique situation where the data that the plaintiff's expert relied on was *supplied by the Defendant*'s consultant, for which he should have suspected may have been "potentially incomplete and inaccurate." *Dreyer v. Ryder Automotive Carrier Grp., Inc.*, 367 F. Supp. 2d 413, 446 (W.D.N.Y. 2005). Here, Reference USA data is data that is independently gathered from a trusted third party, and which is commonly used and accepted.

calculate potential loss for some of the specific named plaintiffs/restaurants identified in Dr. Simons' report shows exactly why this is simply a "battle of the experts" that must be reserved for a jury to decide. *See* ECF 2462-7, PageID.80423 (Dr. Edelstein claiming that U.S. tax return data for two named plaintiffs showed "discrepancies" with the Reference USA data).[57]

iii. Dr. Simons' methodology is not "results oriented."

Defendants next accuse Dr. Simons of "invent[ing] a method that was guaranteed to find that the water crisis caused losses in Flint." ECF No. 2462, PageID.80226. This claim willfully ignores Dr. Simons' actual analysis. Dr. Simons' methodology does precisely the opposite of what Defendants accuse him of: his initial four-step process for identifying which Flint business subsectors may have experienced business losses made no prior assumptions regarding outcomes; and for each step, it was possible that the data would reveal no subsectors with potential losses. In other words, Dr. Simons' methodology could have revealed that Flint businesses suffered no losses; the methodology is agnostic to the result. However, since the data he analyzed did in fact reveal losses, Defendants accuse the

[57] As Dr. Simons noted in his Rebuttal Report the "discrepancies" which Dr. Edelstein cites, which involved comparisons to income tax data only for the two named plaintiffs, both reveal ***greater*** actual revenue declines (per the income tax returns) than were projected in the Reference USA database. *See* ECF No. 2462-5, PageID.80330. If anything, those discrepancies thus suggest that Dr. Simons' estimates based upon Reference USA data may be conservative of the actual losses Flint businesses suffered.

methodology of being "results oriented." This is no more than a disagreement with Dr. Simons' conclusions, not his methodology.

To recap, Dr. Simons first identified 23 potential economic subsectors that had experienced decline in prior periods of economic contraction (Step 1). He then compared the data from those 23 subsectors in the Flint MSA to similar data for the Saginaw and Grand Rapids MSAs to arrive at 11 subsectors that did not experience a similar trend for wage growth as compared to the other areas. He identified these 11 subsectors as ***potentially*** suffering losses from the water crisis (Step 2). *See* ECF No. 1208-95, PageID.36142. The work of calculating whether any losses existed (if any) remained through additional steps such as the examination of gross receipts data and accounting for factors like discount rates and population decline. *Id*., PageID.36142–43. Similarly, at Step 3, Dr. Simons could not know in advance whether any of the more granular subsectors within the 11 broader subsectors he had identified in Step 2 would show sales declines during the relevant period; and again, properly understood, the fact that approximately half of those narrower subsectors did ***not*** demonstrate consistent sales declines relative to other areas undermines Defendants' characterization of his methodology as simply "cherry-picking data."

Defendants' claim that Dr. Simons "discarded problematic data points" from the original 23 to proceed with an analysis of 11 subsectors "that fit his theory" fails to appreciate that Dr. Simons' methodology is not designed to determine whether ***all***

subsectors suffered harm due to the Flint Water Crisis (either separately or in the aggregate), but whether there ***was at least one*** business subsector that ***could have*** suffered losses attributable to the Flint Water Crisis. His methodology operated exactly as it should have: Dr. Simons identified some business subsectors that ***may*** have suffered potential losses due to the water crisis and some that may not have (e.g., the 12 subsectors whose wage-trend data matched Saginaw's and Grand Rapids'). He had no *a priori* assumptions about which of the 23 subsectors would, in fact, match wage trends with the comparators; and it may have been the case that they all matched, in which case there may have been no business subsectors with potential loss. As he notes in his Rebuttal Report, "each step in the process contained the possibility that the data would reveal subsectors exhibiting the potential for losses to Flint businesses." ECF No. 2462-5, PageID.80326. Contrary to Defendants' insistence, it was not "guaranteed" that his methodology would reveal losses. That, at the end of his process, there remained subsectors that showed definitive losses in gross receipts simply shows that the FWC was capable of causing harm to Flint businesses.

That VNA, and its expert Dr. Edelstein, disagree with the ***conclusions*** of Dr. Simons' methodology is a quintessential battle-of-the-experts over how to interpret data, and is not an appropriate basis to strike Dr. Simons' opinions. *See Bonds*, 12 F.3d at 563 ("[C]riticisms about the specific application of the procedure used or

questions about the accuracy of the test" only "go to the weight of the evidence, not the admissibility." (citing *Daubert*, 509 U.S. at 594–95)).

The only case Defendants cite in support of its "results oriented" argument is easily distinguishable. In *In re Lipitor (Atorvastatin Calcium) Marketing, Sales Practices and Products Liability Litigation*, 892 F.3d 624 (4th Cir. 2018), when the expert whose opinion was excluded "first performed the test, it showed a ***statistically insignificant*** association between Lipitor and the onset of diabetes." *Id.* at 634 (emphasis added). The expert then "omit[ed] that result from his initial expert report." *Id.* This is not what Dr. Simons did at all. He did not "omit" bad results. Instead, his methodology readily confronts the possibility that there may have been no businesses in Flint that suffered losses from the water crisis; and indeed, he has applied his methodology through several different models to test (and respond to) various economic theories regarding harm to Flint business owners. That each method showed that the contaminated water was capable of causing harm to Flint businesses is simply a reality that Defendants want to ignore.

iv. Dr. Simons adequately accounts for alternative explanations.

Finally, Defendants claim that Dr. Simons "ma[kes] no effort to investigate whether other economic factors could explain his results" by not analyzing trends in factors like population, demographics, unemployment, or poverty. ECF No. 2462, PageID.80228. As an initial matter, this argument again ignores Dr. Simons' actual

analysis, in which he (1) accounts for wider regional considerations through use of Grand Rapids and Saginaw comparators; (2) accounts for local commonalities and holds the local economic base constant by comparison with the remainder of Genesee County; and (3) accounts for the effects of population loss. *See* ECF No. 1208-95, PageID.36141–43; ECF No. 2462-4, PageID.80308. Dr. Simons' methodology falls squarely within the parameters of how an economist would consider causality in an environmental contamination case.

Moreover, as the Sixth Circuit and this Court has held, "[t]he fact that several possible causes might remain uneliminated only goes to the accuracy of the conclusion, not to the soundness of the methodology." *Jahn*, 233 F.3d at 390 (cleaned up); *Conwood Co., L.P. v. U.S. Tobacco Co.*, 290 F.3d 768, 794 (6th Cir. 2002) ("[i]n order to be admissible on the issue of causation, an expert's testimony need not eliminate all other possible causes of the injury." (citation omitted); *Bazemore v. Friday*, 478 U.S. 385, 400 (1986) (failure to include variables will normally affect the analysis' probativeness, not its admissibility); *In re Nw. Airlines Corp. Antitrust Litig.*, 197 F. Supp. 2d 908, 925 (E.D. Mich. 2002) (holding that defendants' alternative explanatory factors, unaddressed by plaintiffs' expert Dr. Beyer, "merely weaken Dr. Beyer's testimony, but do not fatally undermine it"). Indeed, as the Court held in the Bellwether case in denying in part VNA's *Daubert* motion against Dr. William Bithoney, "[t]o the extent it is unclear whether Dr.

Bithoney excluded any particular cause [of illnesses from lead poisoning], he can clarify his methods at trial" because "Rule 26 contemplates that experts 'will supplement, elaborate upon, [and] explain' the conclusions in their reports at trial." *In re Flint Water Cases*, 2021 WL 5847102, at *11 (E.D. Mich. Dec. 9, 2021) (quoting *Thompson v. Doane Pet Care Co*, 470 F.3d 1201, 1203 (6th Cir. 2006)).

Defendants' argument also ignores the nuances of the question certified for trial: whether the contaminated water conditions in Flint were ***capable*** of harming Flint business owners—not whether they were the sole cause of any business declines. In this light, Defendants' argument about ruling out potential alternative explanatory factors is irrelevant. As this Court has held, "it is uncontroversial that specific causation experts need not rule out every conceivable alternative cause of an injury," and Defendants are free to question Dr. Simons about potential alternative causes for his findings at trial. *In re Flint Water Cases*, 2021 WL 5847102, at *11.

d. VNA mischaracterizes Dr. Simons' use of economic theory in his analysis, and his theories are reliable regardless.

Defendants claim that Dr. Simons' economic theories are unreliable because he did not test specific hypotheses associated with his methodology—theories Defendants characterize as an "aversion-cost" theory and a "redirected-spending" theory. ECF No. 2462, PageID.80029. Once again, this argument willfully ignores the thrust of Dr. Simons' reports. Dr. Simons' analysis rests on the fundamental

principle of the income elasticity of demand—the idea that an economic contraction will affect the sale of certain goods or services based on their respective degree of necessity such that certain sectors are more sensitive than others to possible economic downturns. When consumers change spending habits, not ***all*** business subsectors may be equally affected, so simply considering whether Flint businesses in the aggregate experienced decline would not reveal whether, in fact, contaminated water conditions were capable of harming Flint businesses. Accordingly, Dr. Simons' methodology uses past knowledge about economic contractions and comparisons to geographically nearby metropolitan areas to identify specific subsectors that may (or may not have) suffered harm, and he then does the actual analysis to determine whether there were, in fact, losses.

Defendants try to complicate this simple matter by claiming that Dr. Simons is advocating narrower "aversion-cost" or "redirected-spending" theories. First, Defendants' claim is simply incorrect. Dr. Simons' initial report never uses the term "aversion-cost" nor suggests that any economic contraction tied to the water crisis was limited to residents "spend[ing] less money at local businesses" because they were instead spending discretionary funds on bottled water or water filters. ECF No. 2462, PageID.80229. But Dr. Simons is not offering opinions on whether Flint residents bought bottled water or water filters—he offers opinions on whether the contaminated water conditions in Flint were capable of harming Flint businesses

through general changes in spending habits characteristic of the demand elasticity of certain business sectors. Indeed, in the portions of Dr. Simons' deposition that Defendants cherry pick in support of this position, Dr. Simons clarifies that any potential spending on bottled water or water filters was just "one" or a "partial" aspect of a change in spending habits that may have affected Flint businesses. *See* ECF No. 2462-3, PageID.80258–59.

Second, Defendants' claim that Dr. Simons' "redirected-spending" theory is an untested, new theory is also untrue. In response to Defendants' critiques regarding the "aversion-cost" theory, Dr. Simons' Rebuttal Report clarified that the possibility of consumers deciding to spend money they otherwise would have spent in Flint to areas outside of Flint (due, in part, to the widespread perception that the water in Flint was unsafe) was another aspect of consumers' changed spending habits that could have had a negative effect on Flint businesses. *See* ECF No. 2462-5, PageID.80322. This is neither a new opinion nor one that is "untested"—it is one of several ways that businesses may have suffered provable losses attributable to the FWC.

Finally, Defendants' arguments that Dr. Simons' theory is supposedly not in line with his "results" is just a disagreement with his conclusions rather than a substantive critique of his methodology. *E.g.*, ECF No. 2462, PageID.80233. For instance, Defendants identify several economic subsectors where ***Defendants*** state

Dr. Simons' theory should have predicted business losses, but that, in fact, suffered fewer losses than anticipated. This is not an attack on any specific methodology, but a disagreement with Dr. Simons' conclusions. Under a proper *Daubert* analysis, "the focus . . . must be solely on principles and methodology, not in the conclusions that they generate." *Torno v. 2SI, LLC*, 2006 WL 1521949, at *5 (E.D. Mich. May 30, 2006) (quoting *Daubert*, 509 U.S. at 595)); *see Rhinehart*, 2017 WL 1395887, at *4 (denying *Daubert* motion because "the Court is currently tasked with evaluating [an expert's] methods, not his conclusions"); *supra*, § II(D).

In sum, none of Defendants' arguments against Dr. Simons' opinions is of the sort that is proper for a *Daubert* motion—they not only mischaracterize Dr. Simons' analysis (or willfully ignore key nuances), but they consistently disagree with Dr. Simons' conclusion, not his methodology. Defendants cite heavily to VNA's expert Dr. Edelstein in their motion, and courts routinely deny such battle-of-the-experts motions. *See Phillips*, 400 F.3d at 399; *supra*, § II(E).

IV. CONCLUSION

For all of these reasons, the Court should deny Defendants' Motions to exclude certain opinions of Class Plaintiffs' experts.

June 30, 2023 Respectfully submitted,

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CERTIFICATE OF SERVICE

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Respectfully submitted,

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